

Engineering  
Library



# MOTOR AGE

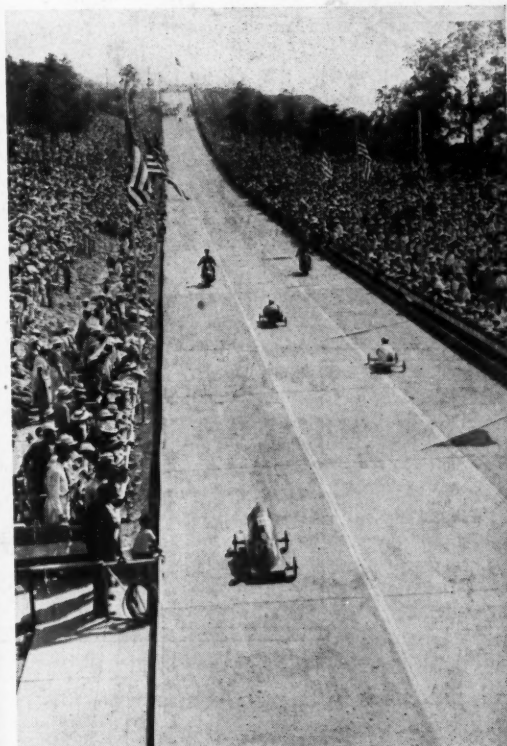
CHILTON PUBLICATION

DEDICATED TO THE INTERESTS OF THE INDEPENDENT REPAIR SHOP

SEP 10 1937

SEPTEMBER  
1937

## IN THIS ISSUE



Soap Box Derby Finals

### Colder with Snow

That's what the weather reports will be saying soon. Start to get ready by reading "Hunt for Winter Service."

### Warmer with Showers

For the warm motorist there is nothing like a cool shower. And there is added profit for the service station that has one. The details are given in "Clean Up with Showers."



# CHAMPION

## SPOTLIGHTS THE BETTER SPARK PLUG

*Patented Features  
and Performance Records  
Definitely Proclaim  
Champion the  
Better Spark Plug*

The exclusive and patented features spotlighted and briefed above are but a few on which Champion claims recognition as the better spark plug—for every engine—for every sales minded dealer.

But—the proof of the pudding is in the eating and we know of no harder spark plug testing laboratory than racing. Here spark plugs are subjected to treatment twice as tough as that experienced in every day driving. Yet in this field Champions have

emerged unscathed and universally triumphant for fourteen consecutive years.

Moreover Champions have been and continue to be the choice of the majority of the world's motorists, which is proof positive that Champion's patented features make every engine a better performing engine. Champions are the spark plugs for you to sell. It's the safest, sanest stock investment on the market today. Sell Champions because you can *depend* on them.



### SILLIMANITE INSULATOR

Sillimanite has demonstrated itself to be the finest spark plug insulator. It has earned first place of all ceramic materials where strength and heat resistance are essential. Champion owns the only commercial deposit of Sillimanite, located in California.

### SILLIMENT

A compressed dry powder which forms an absolute seal and raises the efficiency of Champions way beyond that of any other spark plug. Service troubles, compression loss and early electrode destruction are eliminated. The material, method, process and machinery are all covered by basic Champion patents.

### EXTRA RANGE SHAPED CORE

The only patent of its kind. Covers the heat flow in the firing chamber of a spark plug. Responsible for the wide range of Champion Spark Plugs.

### ELECTRODES

Special alloy with catalytic agent to prevent bridging of gap—oxidation or carbon formation on the wire itself. Covered by broad and exclusive Champion patents.



*The only complete spark plug service unit. Tests, cleans all makes and sizes of spark plugs. Pays for itself in increased sales. Attractively priced. Ask your jobber.*

CHECK AND CLEAN SPARK PLUGS WHEN YOU CHANGE OIL

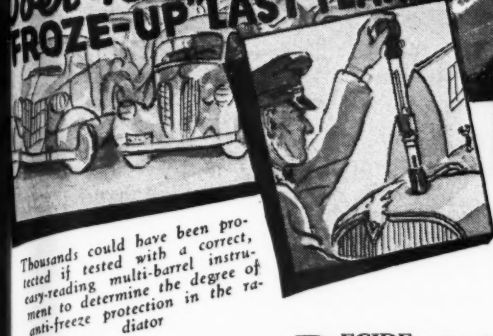


# STOP FREEZE-UPS THIS WINTER

*With Accurate, Lightning Fast Tests*



**Over 450,000 Cars  
FROZE-UP LAST YEAR**



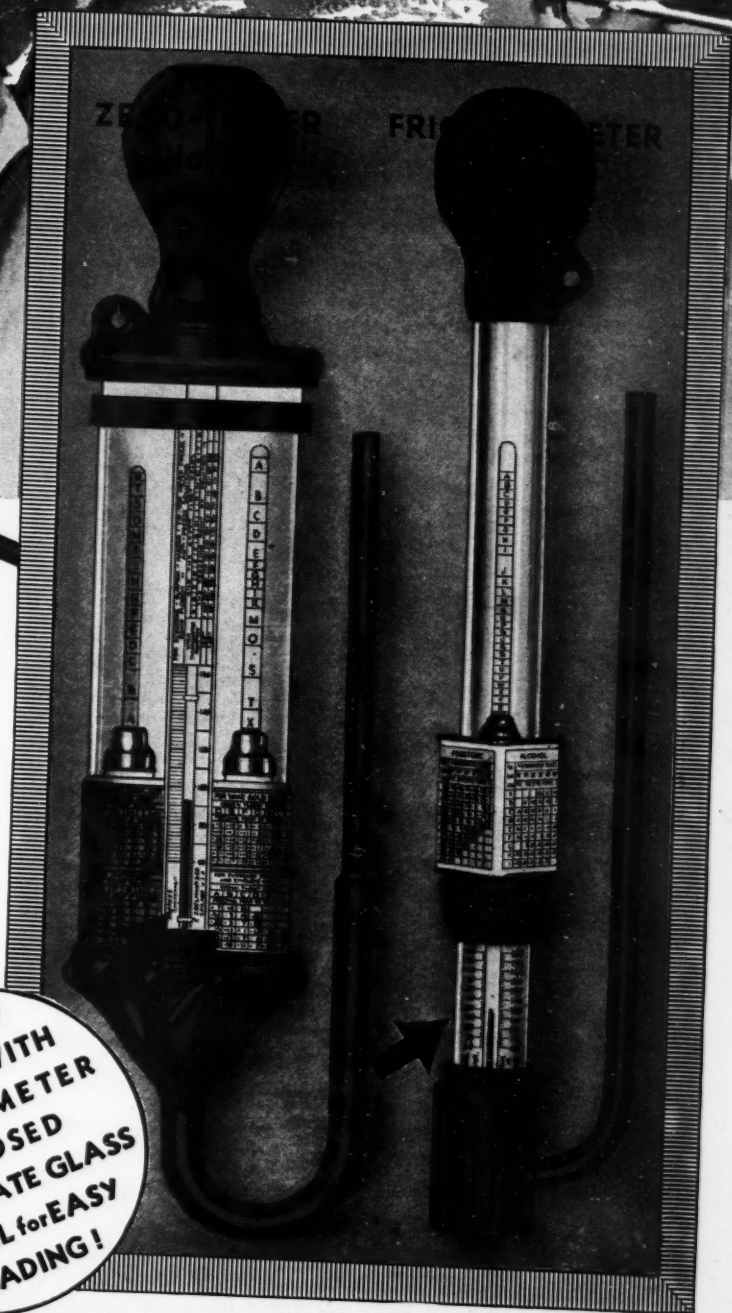
Thousands could have been protected if tested with a correct, easy-reading, multi-barrel instrument to determine the degree of anti-freeze protection in the radiator

**D**ECIDE now to have no "freeze-ups" in the cars you test this winter! Incorrect, difficult-to-read instruments aren't necessary anymore. For the good of your business, your mind, your profit sheet, rely on a tester that provides the surest, quickest anti-freeze tests—an Edelmann. The minute you squeeze the soft, pliable rubber bulb you'll say, "I'll never go back to testing with those out of date, impossible to read testing instruments again." The quick acting thermometer that is never unreadable records the temperature of the solution. Float is flexible and is moulded from a substance—crytogonallic ceramitose—that has forty times the strength of ordinary glass. And if you have to make costly replacements for delicate glass parts, remember Edelmann Flexible Floats have 70 per cent less glass than other similar instruments.

● Edelmann's separate, enclosed thermometer barrel enables you to test correctly regardless of the dirt, grit or filth in the radiator solution. And Edelmann's testers are priced **RIGHT** so you just can't afford to take chances with second rate, "bargain priced" testers. Be sure you get genuine Edelmann Zero Testers or Frigid-O-Meters.

**E. EDELMANN & CO., Chicago**

**THE ONLY  
TESTERS WITH  
THERMOMETER  
ENCLOSED  
IN SEPARATE GLASS  
BARREL for EASY  
READING!**



# EDELMANN

*Anti-freeze* **TESTERS**

# NEW NEWS *about*



# ZERONE

*Announcing a powerful promotion  
campaign to help you make more money  
this winter on anti-freeze*



THE theme of this increased advertising campaign has been *pre-tested*. We know in advance that it will help bring millions of motorists into stations to ask for "Zerone" anti-freeze. Right from the start there will be *more* people demanding "Zerone" this winter.

This advertising will tell *more* people than ever before about "Zerone" efficiency, "Zerone" economy, and "Zerone" dependability. It will put you in a position to make *more* sales and *more* money this season than ever before. Make sure people see that you are a "Zerone" dealer—hang up the "Zerone" banner early.

If you have not ordered your "Zerone"—do it now. If you've already arranged for your supply of "Zerone"—you're in a swell position to profit!

**E. I. DU PONT DE NEMOURS & CO., INC.**

"ZERONE" SALES, WILMINGTON, DELAWARE

# MOTOR AGE

DEVOTED TO THE INTERESTS OF THE INDEPENDENT  
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# MOTOR AGE

SEPTEMBER  
1 9 3 7

## SHOP TALK

### If Winter Comes

With summer about over and winter just around some corner, it is time for all shops to start working on their winter service campaign. Read the article, "Hunt for Winter Business." It will remind you of some of the things you have to do if you are to get your share of winter profits.

### Ring Gear and Pinion

Last week I had to go to Altoona to get a story on the success E. H. Thompson has had since he installed a lift in the State Garage. Everything went well until just outside of Belleville, Pa., when the rear axle gave a couple of grunts and I came to a stop at the side of the road. There wasn't much the matter, only all the ring gear rivets were sheared. Well, you can't overhaul a rear axle with a broken monkey wrench and a five-inch screwdriver, so I hitch-hiked into Belleville, where I found Lowell Alexander, who spends part of his time running a shop and a Chevrolet agency and the rest of it in Harrisburg as a State legislator. Well, Lowell and his chief mechanic,

Jim Warner, soon had the job apart, and then came the battle of trying to get parts. I guess we phoned every jobber within 50 miles. While they all said they could get the parts within 24 hours, none of them had the parts in stock. Well, I couldn't wait, so we riveted on the old ring gear and I went on my way sounding like an old-fashioned trolley car with spur gears. What a drive! From Altoona, I drove to Indiana, Pa., and then home. Altogether about 400 miles with that ring gear growling every foot of the way. I finally landed in Lionville, about 40 miles from Philadelphia, when I couldn't stand it any more. So I pulled into the Lionville Garage, where Elmer Kochel and his mechanic, "Peanut" Fayfinger, rebuilt the rear axle in four hours, which doesn't include two hours waiting for parts from Philadelphia.

### Don't Shoot Pard!

Cliff Oppel, from Duluth, Minn., must have been reading a lot of gangster stories just before he wrote demanding an answer to a previous letter. Wrote Cliff: "I won't send you my check for renewing my subscription to *Motor Age* until you answer my letter." Not wishing to have Cliff miss any of the good things of life, his letter was answered pronto. Now I'm waiting to see if he fulfills his part of the bargain. But, seriously, vacations have had me doubling in brass, and some things I have let slide. I'll be all caught up by the time this gets to press. I hope. I hope.

*Bill Tobolsky*



**A HUNTING WE WILL GO** —————

## **FOR WINTER BUSINESS**

**And it will be a cinch for those shop owners  
who start to prepare now before cold  
weather arrives.**

**T**HE approach of Autumn may mean the opening of the hunting season, the beginning of football or the start of school. But to repairmen it means time to start preparing for winter service.

To the careless operator, the man who says auto repairing is a lousy business, it will probably mean a poor business season which he will get through somehow with the aid of a few sales of anti-freeze and, if he is lucky, a few sets of skid chains and a heater or so.

To the shop operator who is on his toes to all opportunities, the winter selling season almost equals that of spring. Of course, the first thought that anyone has when thinking of winter business is the sale of anti-freeze. That's natural enough, as every car will need some. But to the experienced operator anti-freeze means more than that! To simply sell anti-freeze gives you only the profit from that one item. In addition, the experienced shop man, with one eye on the profits and the other on keeping his customers satisfied, sells a complete cooling system service which includes a thorough flushing and cleaning of the cooling system, checking of thermostats, replacement of radiator hose, renewal of side plate gaskets and the installa-

tion of new water pump packing. In addition, any radiator leaks that may be discovered are repaired.

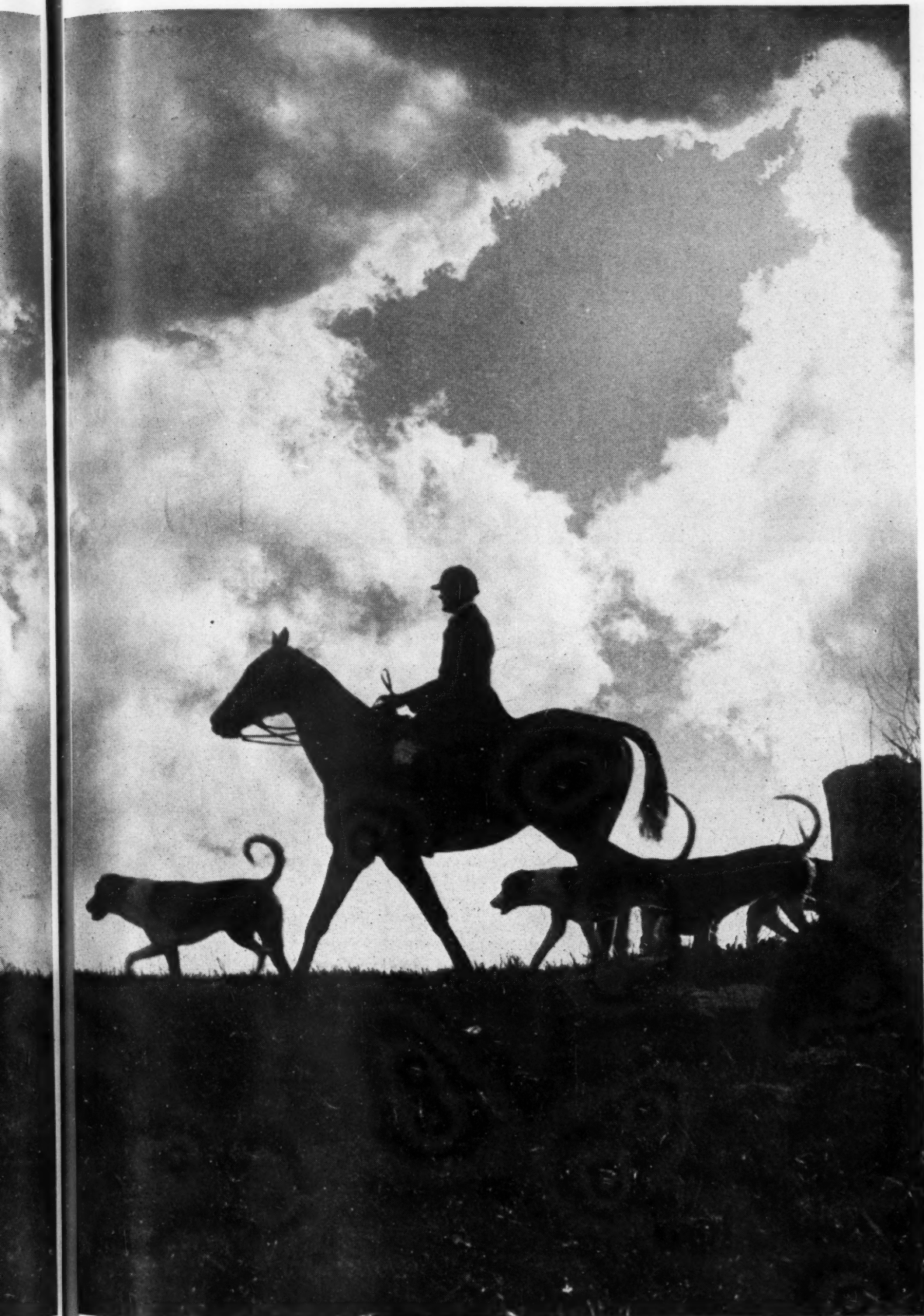
Such cooling system service is important and necessary regardless of the type of anti-freeze that is sold but is more important when the permanent type is used. If the cooling system is not clean, free from rust and water-tight, the anti-freeze will leak out, with the result that the shop owner has a dissatisfied customer or has lost him completely.

Another service the experienced operator sells during the fall is a complete winter check-up, including distributor, timing, spark plugs, condenser, battery, battery cables, all low tension terminals and connections, engine ground connection, high tension cables, compression, tappet clearance, carburetor and fuel screens, fuel pump, heater hose, windshield wiper and connections and generator charging rate. The winter mechanical check-up should also include brake adjustment or relining, if necessary.

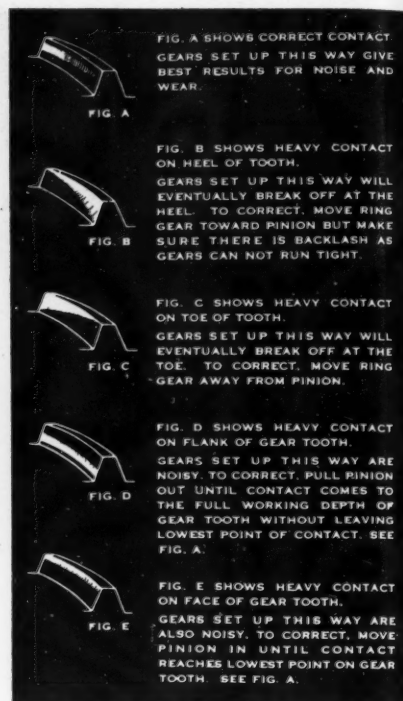
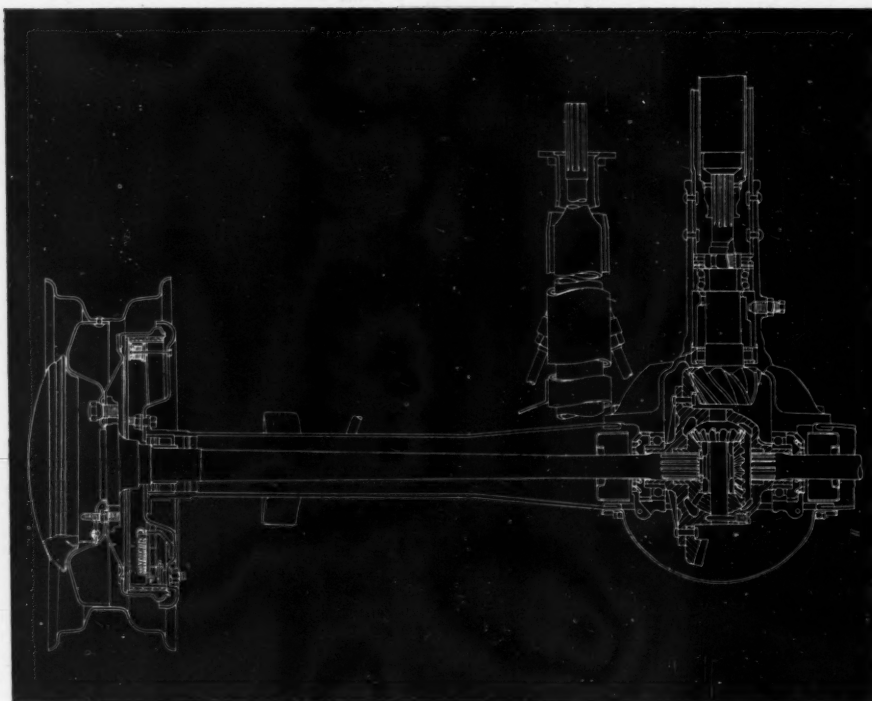
If all of the foregoing items are checked and properly adjusted, the customer will be assured of having a car that will not only start, regardless of how cold the weather may be, but will also perform well.

*(Continued on page 80)*





**BY BILL TOBOLDT**



# Servicing

**S**ERVICING Buick rear axles isn't any more difficult than other types and while every mechanic has overhauled rear axle assemblies of various makes and designs, the service procedure as recommended by the Buick factory is of considerable interest. Furthermore, a good deal of the Buick procedure is applicable to other makes of axles as well.

All 1937 series of Buick rear axles are of the semi-floating type with the load carried on the axle shafts. A torque tube is used to take torque and driving reactions, and with the exception of the 1937 series 40 and 60 which use hypoid reduction gears, all series use spiral bevel pinion and ring gears. In this connection, the same adjusting procedure is followed for both spiral bevel and hypoid gears.

On 1937 models the hub flange is forged integral with the axle shafts as shown in the illustration.

On the series 40 and 60, the shafts are retained by horseshoe or "C" washers recessed in the differential side gears and end thrust on the gears is taken by a steel spacer block in the center of the differential. Clearance of the spacer blocks and axle shaft ends should not exceed .008 in.

In the case of the 80 and 90 series, end thrust is carried by a malleable casting and the shafts are retained by a nut and cotter pin.

To remove the axle shafts, remove the wheels and then the horseshoe

washer or nut and cotter pin (as the case may be) from the inner ends of the axle shaft. The axle shafts can then be withdrawn.

Two leather oil seals are used on the rear wheels of all Buick 1937 cars. The inner seals are pressed into the housing. In the case of the 40 and 60 series the oil seals can be taken out by removing the backing plate and a spacer. The outer retainer can then be removed. Next, pull the bearing and then the inner oil retainer can be removed.

On the series 80 and 90, the oil seal is assembled in a retainer which is bolted to the brake backing plate. Removal of the brake backing plate permits removal of the retainer. Then, after pulling the wheel bearing the inner oil seal can be withdrawn. This retainer should not be bolted up tight until the axle shaft is in place so as to permit the seal to center itself on the axle shaft.

In addition to the outer retainers, there is also an oil baffle at the differential ends of the shafts.

When, as the result of improper or insufficient lubrication or other abuses, it becomes necessary to replace the pinion and ring gear, the first step is to raise the rear end of the car by means of a chain hoist. Remove axle shaft, then disconnect the universal joint, brake lines, and the spring from the rear axle. The rear axle assembly can then be rolled out from under the car.

Remove differential cover and then the caps from the differential bearing. This will permit removal of ring gear and differential assembly. Drill out the ring gear rivets, using a  $\frac{3}{8}$  in. drill. (Do not cut rivets with cold chisel as this will distort the differential case.)

Then, drive out the rivets, taking care to back up the case. After removing the ring gear, check the ring gear flange on the case for run-out. This can be done by mounting the case in V-blocks and checking with a dial gage. If the run-out is in excess of .002 in., the case should be trued in a lathe or replaced.

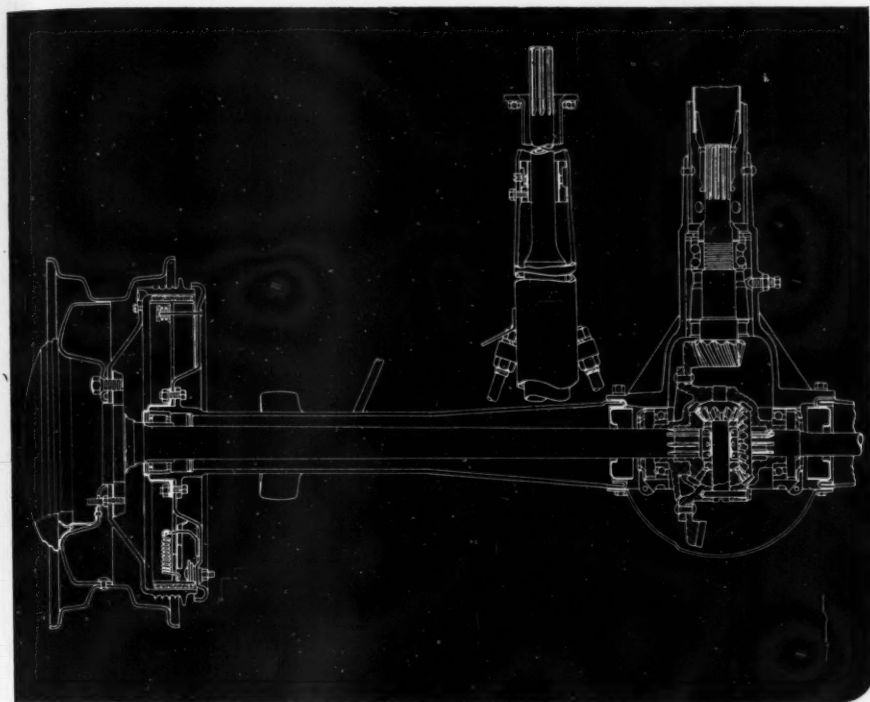
With a file remove any burrs from around the rivet holes. Then, temporarily bolt the gear to the case using  $\frac{5}{16}$  in. diameter bolts placed in alternate holes. Then rivet the ring gear to the flange, placing the rivets in the holes between the bolts. Do not work around the gear when riveting but after heading up one rivet, the next one to be headed should be diametrically opposite the first. Rivets should completely fill the rivet holes and should extend  $\frac{5}{16}$  in. beyond the flange before heading.

Do not heat the rivets but use a riveting fixture and rivet set for the job.

Check for run-out at back of gear which should not exceed .006 in.

Now to replace the pinion, file off one head of the straight pin which passes through the shaft coupling and





BY  
**BILL TOBOLDT**

# g Buick Rear Axles

the propeller shaft. Pull the pinion from the propeller shaft using a special puller. Pry up staked section of pinion bearing nut and remove nut, gripping shaft on splines. Press off pinion front bearing using blocks under outer race.

To reassemble with the necessary new parts, drive bearings on pinion shaft using a piece of tubing of such size that it bears directly on the inner race. Assemble pinion bearing nut and after same is drawn tightly, stake into the notch of the pinion shaft.

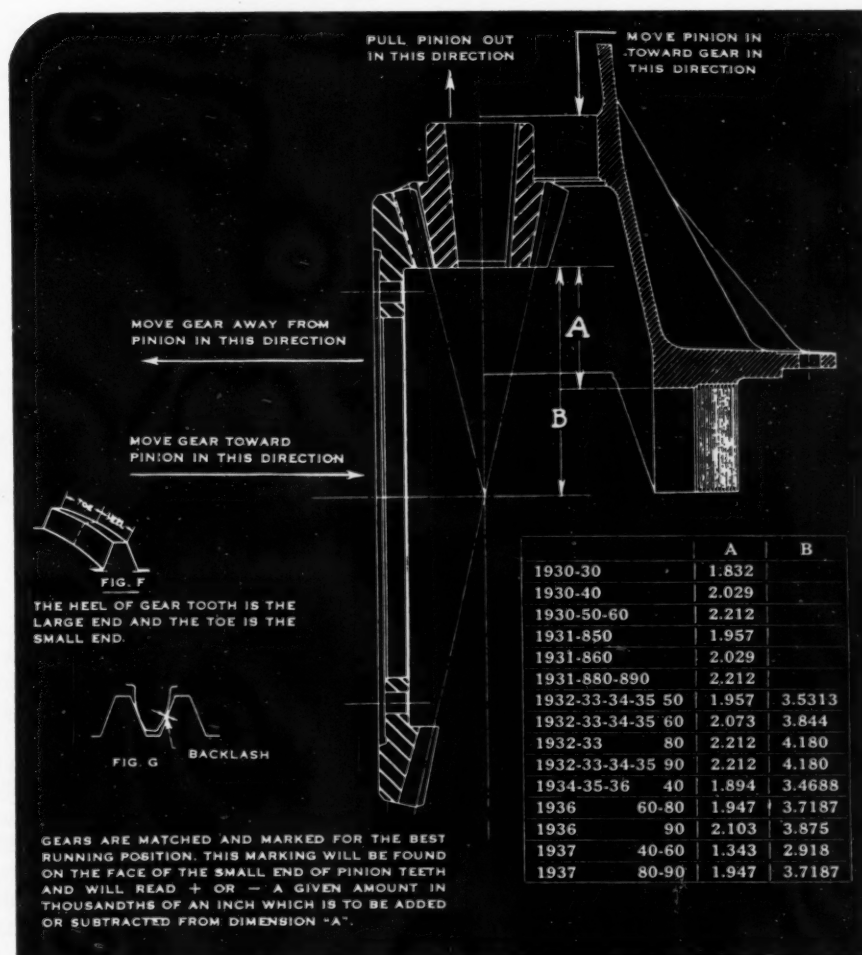
Assemble pinion shaft to propeller shaft using a special pusher. Then, using a new pin, rivet over both ends.

To assemble propeller shaft in torque tube, tap the outer race of the roller bearing forward. This outer race should seat against the collar which is against the double row bearing.

In connection with the installation of a new pinion and ring gear, which are only supplied in sets, the Buick Company supplies a container of Hypoid S.A.E. 90 lubricant, the same as used in production. New gears must be "broken-in" the same as a new car even though this special lubricant is used.

There are two methods by which the pinion and ring gear can be adjusted. One requires a special gage while the other is the familiar white or red lead method.

(Continued on page 56)





**By  
G.  
CHARTERS**

# Clean Up With Showers

**Showers prove a blessing to the motorist  
and a source of profit to the shop owner**

**F**ROM Edmonton, Alberta, to Fort St. John, B. C., there are 550 miles of main highway into the Peace River country, and only one shower bath! The dusty motorist who craves a shower—and who doesn't?—must stop at Grande Prairie, 400 miles from Edmonton, where J. H. Charters has recently installed a shower in connection with his garage and service station.

It should be explained here that the towns of that fertile farming country depend for their water supply on the town well. Water and sewage systems are so far confined to hotels and a few private resi-

dences. But hotel baths cost 75 cents and can never take the place of a shower (at 25 cents), on a hot, dusty day. So Mr. Charters decided to add that feature to his service station.

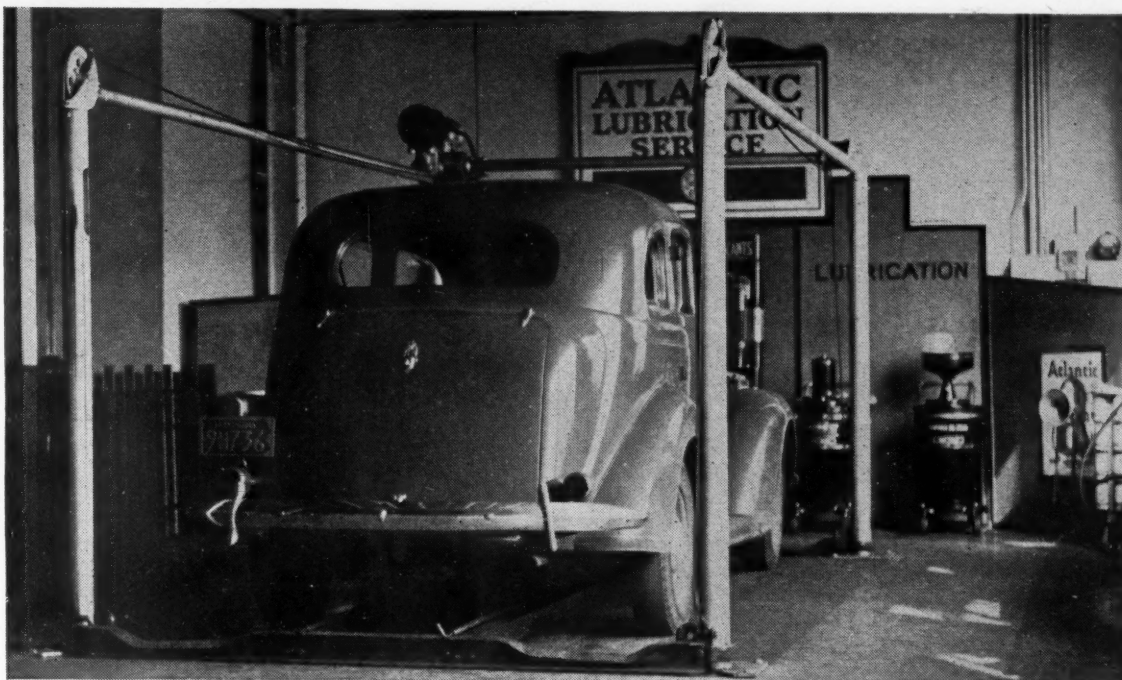
The garage was already equipped with an overhead storage tank for the usual service station purposes, filling and washing cars, etc. The water supply came from an underground cistern which stored rain water from the roof of the garage and was pumped into the tank by

means of a small automatic electric pump.

Four feet from the building a wooden bathhouse, 8 ft. by 8 ft., divided into two compartments, each with dressing room and shower, was built. The floors sloped to drain the water into a ditch outside.

A water heater was built by putting a 28-gal. drum inside a 45-gal. drum. That is, in the smaller drum, which was to be the firebox, (Continued on page 76)





## Raising Profits With Lifts



**Here's how one operator increased the number of his customers and his profits**

**I**NCREASING the number of lubrication jobs from 30 per month to 175 as the result of the installation of a lift, is the accomplishment of the States Garage, Altoona, of which E. H. Thompson is manager. The lift was installed on May 5, of this year 90 jobs were handled during the balance of that month. The same number of cars were lubricated in June, while in July 150 cars were serviced.

In addition to the installation of

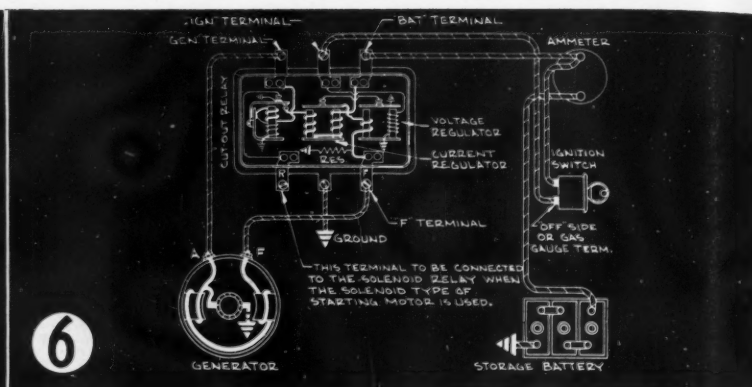
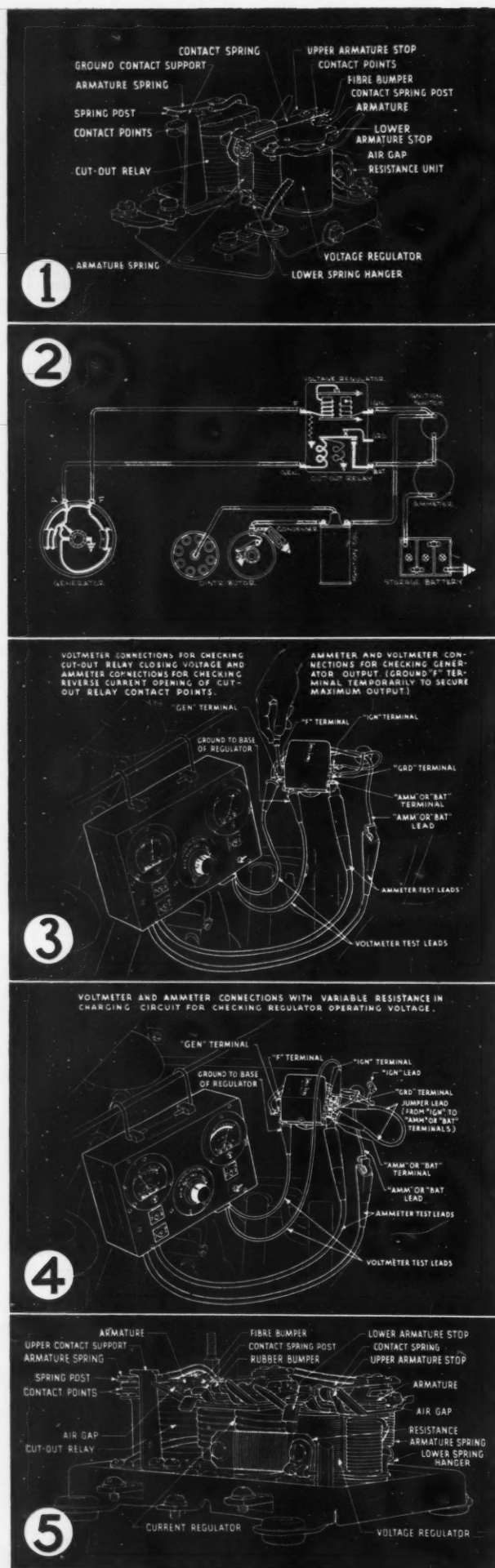
the lift, the walls were decorated, the floor painted and attractive canopies hung from the ceiling to departmentalize the lubrication service.

Mr. Thompson states that during the first month of operation the lubrication jobs averaged \$3.50 each. Some individual jobs running as high as \$8.00. Approximately 100 sets of front wheel bearings were lubricated at \$1.00 per wheel.

In order to maintain and increase the lubrication business, Mr. Thompson uses a follow-up system provided by the company from whom he buys his lubricants. This system keeps a record of each car that is lubricated, with the name, address and telephone number. In addition the make of car is given together with all the work that was done. The speedometer mileage is also listed.

At regular intervals, the car owner is notified that his car is due for another lubrication job. Generally the car owner receives such notice by mail, but in some instances telephone or personal visits are used.

In addition to the cars that store regularly at the States Garage (it has a capacity of 105 cars), new customers are secured by means of direct mail letters and folders.



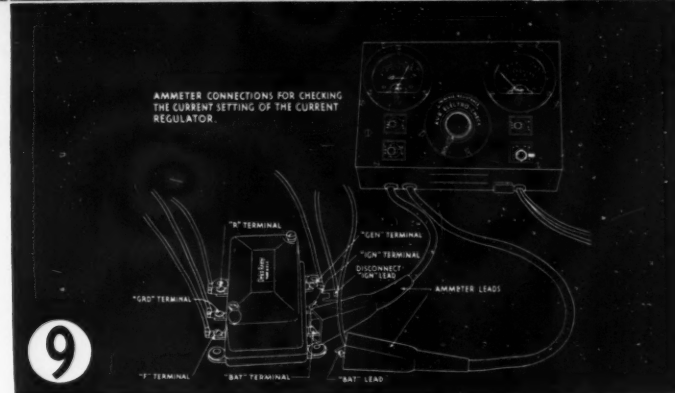
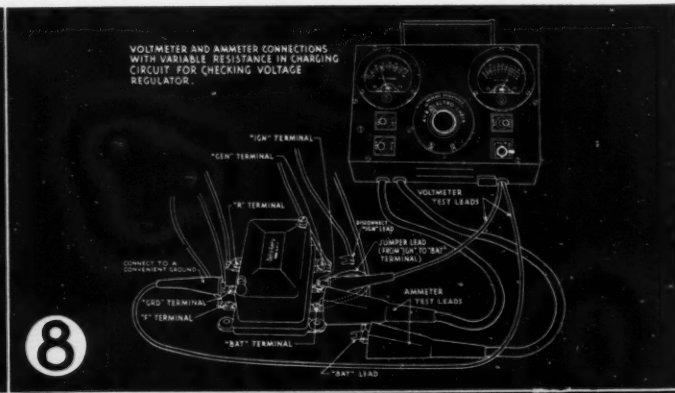
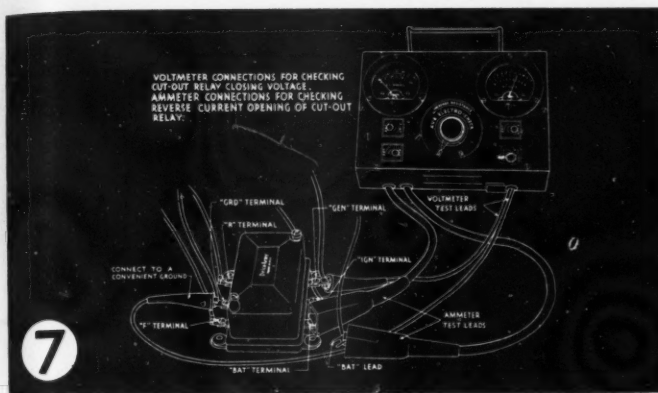
# Current Control Service

THE Delco-Remy Vibrating Voltage Regulators, illustrated in Fig. 1, consist of a cut-out relay and a vibrating voltage regulator unit, mounted for convenience on the same base and enclosed by the same cover. On some models an extra set of contact points is incorporated on the armature of the cut-out relay to provide an added safety device in the starting motor solenoid relay circuit. The terminal and auxiliary set of contact points are insulated from and are not a part of the generating system. Refer to Fig. 2 for circuit diagram.

The cut-out relay and voltage regulator unit operate as previously described in the August issue. The regulator is designed to be used with third brush generators. As previously stated, the regulator will not increase the generator output beyond the maximum for which the generator is designed.

The regulators are overcompensated for temperature so they have a lower voltage setting when hot. This compensation for temperature is very desirable as a cold battery requires a higher charging voltage than one that is warm. In addition it not only eliminates the necessity of changing the voltage setting for summer and winter driving, but it also varies the charging voltage in more nearly exact accordance to battery requirements.





BY WILLIAM H. CROUSE

## This, the second of two articles, describes the service procedure on Delco-Remy current and voltage regulators

### Procedure for Checking the Vibrating Voltage Regulator

**CUT-OUT RELAY**—Connect an accurate reading voltmeter and ammeter as illustrated in Fig. 3. Do not ground the "F" terminal for this test. Gradually increase the engine speed and note the voltage at which the cut-out relay contact points close. Gradually decrease the engine speed and note reverse current necessary to open the points. If necessary adjust according to instructions under CUT-OUT RELAY ADJUSTMENTS.

**GENERATOR OUTPUT**—With the meters connected, as illustrated in Fig. 3, ground the "F" terminal as shown. It is necessary to ground the "F" terminal while making this check so the voltage regulator cannot operate and influence the generator output. The generator voltage should be noted while checking the output as a low voltage will prevent the generator from producing its rated output. The generator

voltage can be increased by increasing the resistance in the charging circuit. Insert a variable resistance of sufficient current carrying capacity in series with the ammeter and cut in resistance until the voltmeter registers the correct voltage. In using an AVR or similar tester to insert the resistance it is only necessary to turn the resistance knob. If the generator fails to produce its rated output at the specified voltage, the third brush should be adjusted or it should be removed for a bench check.

**VOLTAGE REGULATOR UNIT**—To check the voltage at which the regulator is operating, disconnect the "IGN" lead from the regulator and place a jumper lead from the "IGN" to the "AMM" or "BAT" terminal and connect the ammeter and voltmeter leads as illustrated in Fig. 4. Gradually increase the engine speed until the generator is charging 8-10 amperes at a generator speed of 2000-3000

r.p.m. and operate until the regulator unit reaches operating temperature.

In order to maintain the 8-10 ampere output, it may be necessary to insert resistance in the charging circuit, as was done above under GENERATOR OUTPUT. If the charging rate is less than 8 amperes with all the resistance out of the circuit, turn on the lights in order to maintain this output while making the check. **VOLTAGE READINGS MUST BE TAKEN WITH THE REGULATOR HOT (150 deg.) TO BE SURE IT IS PROPERLY ADJUSTED. COVER MUST BE IN PLACE.**

### Cut-Out Relay Adjustments

(For Voltage Regulators See Figure 1. For Current and Voltage Regulators See Figure 5.)

**AIR GAP**—With the contact points closed, measure the air gap between the armature and core. Adjust air gap by loosening the  
(Continued on page 62)



# 37 years a maintenance man

by F. K. HASKELL

**H**ERMAN W. REIBENSTEIN, of Portland, Ore., should really be called the Father of the Automobile in the State of Oregon, as he not only worked on the first automobile that came to that state, but was also issued driver's license number one, and this qualified him not only to operate a gas car but steam and electric as well.

Mr. Reibenstein's association with the automobile dates back to 1901, and prior to that was associated most prominently with the bicycle business, having been em-

ployee number one with Harry L. Keats, Oregon's first automobile dealer, and also in the early years prominent in the bicycle business. A third pioneer was also associated with these two builders, Fred T. Merrill, who first was a great bicycle rider, and later another pioneer automobile dealer in the state.

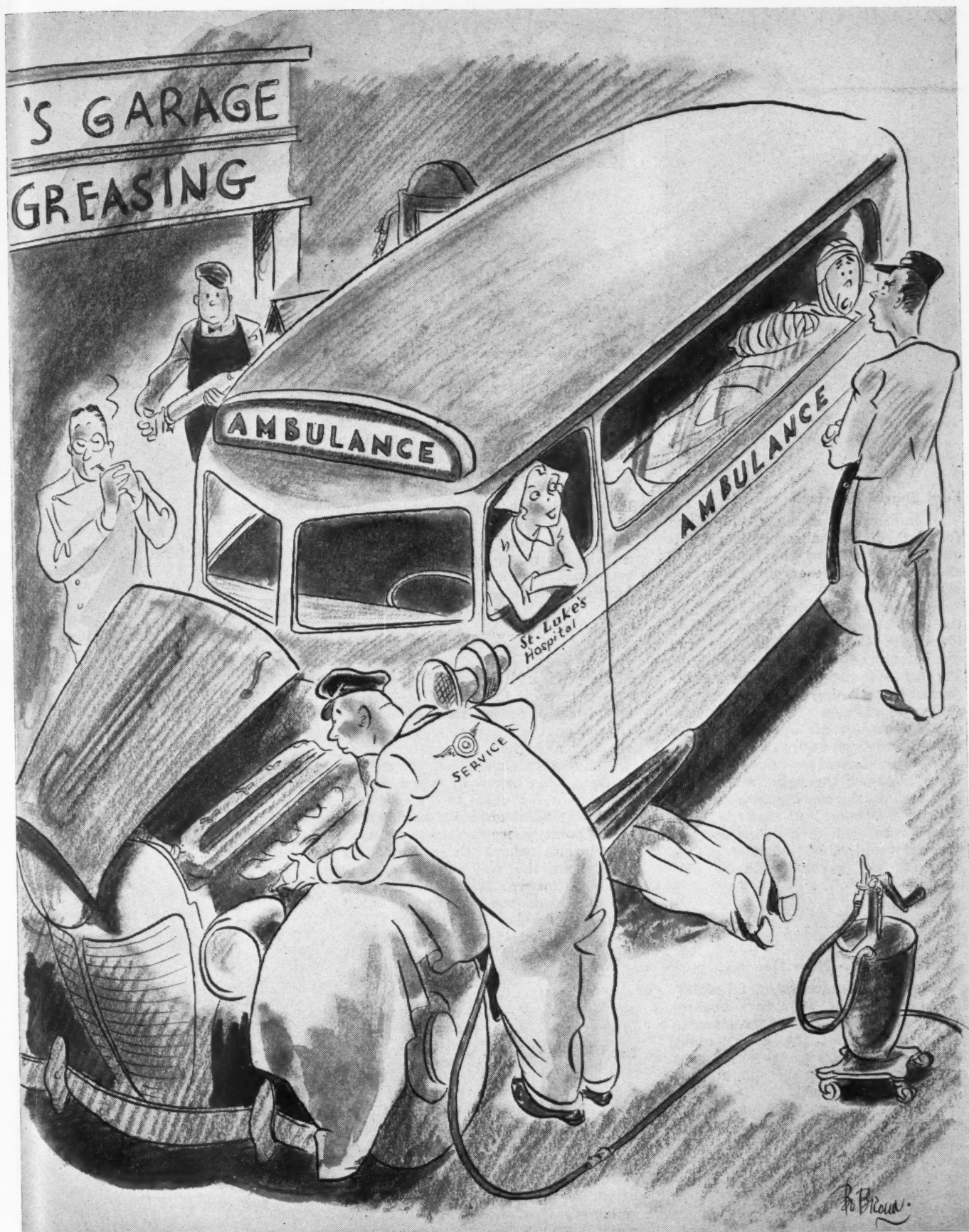
Knowing the innards of all makes of cars thoroughly, Mr. Reibenstein was called on frequently by all autoists in those early days to solve the most intricate motor

problems, and he still is, having kept well abreast of motor mechanics with all its changes. This, in spite of his 65 to 66 years, some forty of which he has been closely associated with both the bicycle and automobile mechanics.

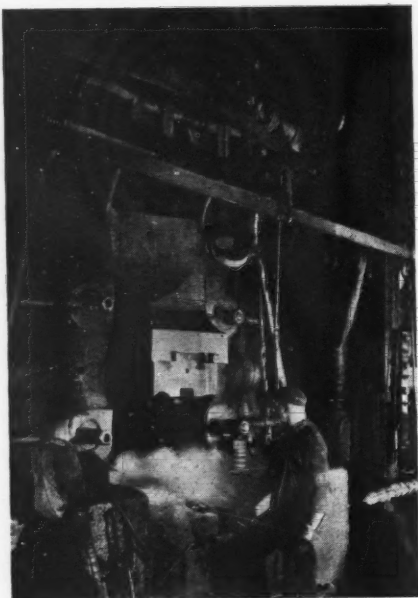
The subject of our sketch was with the Harry L. Keats Motor Company during the years 1905 to 1915, and assembled the first automobile shown at the Lewis & Clark Exposition in Portland. The Olds was first featured by this firm and later they handled in the early years the Reo, Hudson, Pope-Toledo, Pope-Hartford and Pope Chalmers. Later were supplemented to these makes Packard,

(Continued on page 80)





**"Keep your shirt on pal, it's a thousand miles so she's gotta be greased"**



# Service Hints

## From the Factories

### Ford Shock Absorbers

In numerous instances it has been found that shock absorber leakage is due to the level of the fluid in the shock absorber reservoir being too high.

When shock absorbers are filled on the car, sufficient time should be allowed for the surplus fluid to run out before the filler plug is replaced. This is extremely important as the correct functioning of the shock absorber depends on the reservoir having the correct air space to absorb the excessive pressure which otherwise would force the fluid out of the shock absorber through the packing.

When filling shock absorbers off the car it is important that the shock absorber be held in the same position that it would be if mounted in the car, and the surplus fluid be permitted to run off.

### Cadillac-La Salle Door Handles

Outside door handles on all Cadillac and La Salle 1937 cars are removed by unscrewing the set screw in the inside end of the door handle. The lock finish plate must be removed on series 37-65, 70, 75, 85 and 90 Cadillac cars to reach the set screw. Inside door handles, including remote control handles, ventilator handles and window regulator handles, are removed by pressing back the finishing plate against the trim to permit release of the handle-locking device. On Fisher bodies this device is simply a horseshoe-shaped spring wire which can be snapped off with a narrow screw driver. On Fleetwood bodies a plunger is used which must be depressed with tool No. HMB-127 to release the handle.

### Olds Trunk Lid

Noise at the trunk lid on 1937 Oldsmobile may be occasioned by the rubber shield being dry and working against the lid panel. To overcome this condition coat the top of the rubber with talcum or chalk. Noise at the lock bolt may be caused to lack of lubrication of the lock bolt or too much tension of the bolt at the underside of drain gutter. To correct, lubricate lock bolt and contact space of the lock bolt at the gutter. Tension of the lock bolt at the gutter may be decreased by inserting a shim between the lock bolt plate and the compartment lid.

### Studebaker Heat Indicator

It is possible in some of the earlier 1937 Dictator models that the heat indicator on the instrument board will indicate a higher temperature than actually exists throughout the cooling system. This has been found attributable in a few cases to the fact that the heat indicator bulb was located at the point where temperatures were considerably above those prevailing throughout the rest of the system. A correction was made, to provide a more accurate reading, by the addition of two holes in the water manifold with direct water around the heat indicator bulb. The change was effected with engine number D-130749.

### Ford Brake Cables

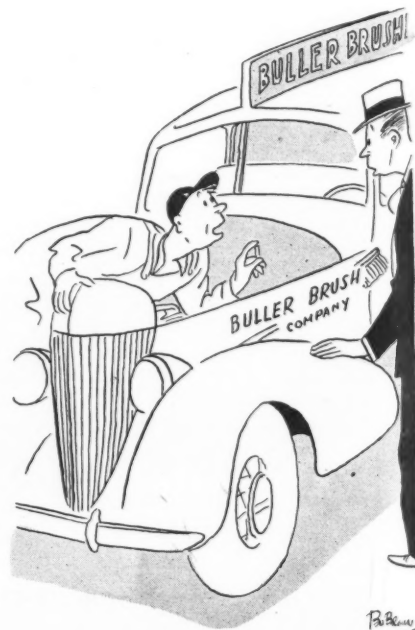
When brake cables are adjusted too short the primary shoe is held away from the anchor pin. At any time when the hubs are removed a quick check of this condition can be made by forcing the primary shoe against the anchor pin using a screw driver or tire iron as a lever. The secondary shoe will move if the primary shoe is resting against the operating wedge instead of the anchor pin. It is important that both shoes rest against the anchor pin when the brakes are in the released position.

### Buick Transmissions

The transmission cases, gears and complete transmission on 1937 and 1936 series 40 Buick are interchangeable. On series 60, 80 and 90 Buick only the complete transmission assembly is interchangeable between the 1937 and 1936 series.

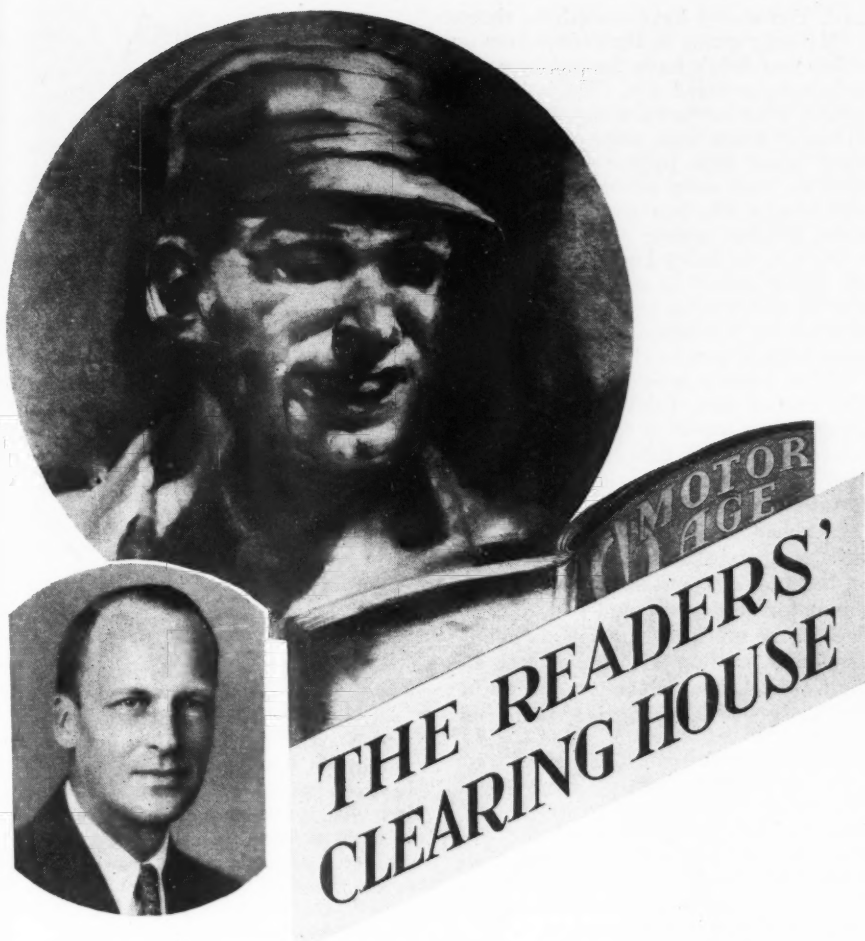
### Brake Seals

The brake seals that are installed on 1937 series Cadillac cars must be removed whenever any work is done on the brakes that requires removal of the brake drum. Removal of these is easily performed by expanding the seal and lifting it from the dust shield after removing the nut on the clamp screw where the two ends of the steel are fastened together. Installation can be made by reversing the above procedure.



"You need new brushes."





**BILL TOBOLDT, Editor of MOTOR AGE, conducts the Readers' Clearing House. He presents some of the thousands of questions asked by readers of Motor Age together with a practical analysis of the difficulties in his replies. You, too, are cordially invited to send us your problems.**

### BILL, YOU ARE ALL WET!

Thomas Lepore, 5997 St. Andre, Montreal, Quebec, when he saw my answer to Charles W. Kuba in East Liberty, Ohio, with reference to the trouble he was having with burning distributor points on a 1933 Plymouth, took his pen in hand and said—Bill, you are all wet. The trouble can be overcome by the installation of a special insulated resistance wire assembly, part No. 611589. This wire replaces the standard low tension primary wire running from the coil to the connection on the side of the distributor.

Many thanks, Tom, I'm sure your answer is better than mine.

### WINDSHIELD LEAKS

*What can I do to stop a leak around the windshield on a Hudson eight, 1935 model. Also, on this same car, I am only getting 10 m.p.g. and the engine gallops. I have done every-*

*thing possible in an attempt to overcome this trouble. Any suggestions you can make will be appreciated. What about trying smaller jets? Marshall Joppies, Burnips, Mich.*

**W**ITH reference to the leak in the windshield of the 1935 Hudson, this can be overcome by refitting the glass and using special windshield glass putty so as to insure that it is tight. In addition, I suggest that you check the cowl ventilator and make sure that the gasket is in good condition.

Now with reference to the engine galloping and the poor mileage, if the valves and rings are in good shape the trouble will probably be found in the metering pin in the carburetor. Make sure that the metering pin is not bent and that it is centered in the well.

Be sure that you have good compression in each cylinder and also that there are no intake manifold leaks and that the intake valve stems and guides are in good condition.

## ALUMINUM PISTONS

### IN CHEVY

*I have here a question I would like you to settle. I have been told that aluminum pistons will not work in a 1929 Chevrolet. Will you please advise me if they will or not, and if not why? Wm. M. Cole, 118 Valley Blvd., Wheeling, W. Va.*

**T**HERE is no reason why aluminum pistons will not work satisfactorily in a 1929 Chevrolet. As a matter of fact, they can be used to replace cast iron pistons in any engine with the exception of the V-type.

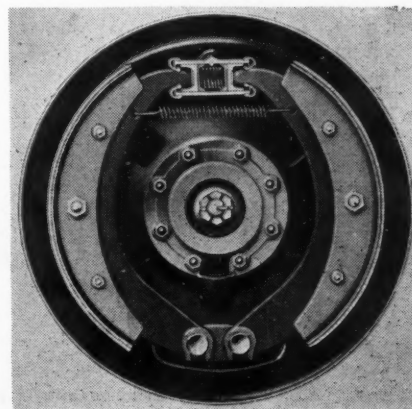
All in-line engines are inherently in balance and changing the weights of the pistons will not cause any difficulty. However, don't try to install aluminum pistons on a V-type engine which is originally equipped with cast iron as it will result in considerable vibration, because the difference in piston weights will result in an unbalanced condition.

## LEAKING WHEEL CYLINDERS

On occasional complaints where wheel cylinders seem to leak after new cups have been installed and where the leak is not due to rusty, pitted, gummy or scratched cylinder walls, we have found that if the spring is not seated properly in the cavity of the cup and is caught on the edges, it has a tendency to distort the cup and make it leak.

When the cylinder is assembled in a horizontal position, the spring usually lies on the bottom and when the cup is pushed in, the spring does not center itself. When assembling cylinder on the bench and it is held in a vertical position, it is easy to overcome this difficulty. However when the cylinder must be assembled while on a car, care must be exercised that the spring is properly seated.

When a rebuilt cylinder leaks unduly because of a poorly seated spring, marks of the spring will be found on the cup and these marks are of assistance in diagnosing this trouble. E. Schwarz, Eis Mfg. Co., Inc., New York City, N. Y.



## CARL, YOU HAVE SOMETHING THERE!

We have a 1936 Packard 120 equipped with Mallory distributor that will go from 5 to 60 m.p.h. in  $\frac{1}{4}$  mile in 24 seconds when tuned up, but when the points burn into each other so badly that it misses three times in the same trial, it will go the distance in 21 seconds or less.

Immediately after running the test we have gone back to the shop and put in new points, set them the same distance, set timing the same and gone out again only to have the time fall off three or four seconds.

Why should this car get out better with burnt points in spite of the miss than it will with new points? We are setting them according to Mallory specifications and the timing according to Packard. Carl G. Ferguson, 800 Lore Ave., Gordon Heights, Wilmington, Del.

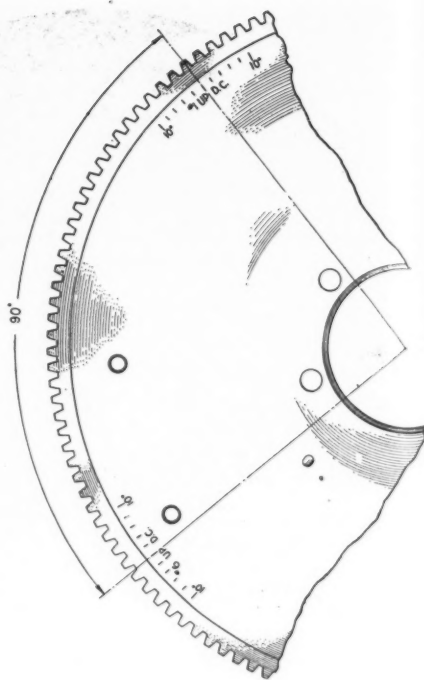
WELL, you certainly gave me a tough problem trying to solve the trouble you are having on a 120 Pack-

ard. You surely have something there.

My only guess is that some how or other you didn't have the points properly synchronized and then after the points were burned a little bit and the rubbing block was worn a little bit, they came into proper synchronization so that even though the engine did miss a bit, you were able to develop greater speed.

As you probably know, the flywheel on the Packard is marked to enable you to synchronize the points and you can see the markings by removing the snap button around the starter.

After setting both sets of points to the proper gap, rotate the motor to five degrees ahead of top center, number one cylinder firing; then set the fuel compensator to the zero mark. Rotate the distributor backward and then ahead until the fixed points just start to open. Then tighten the clamp on the fuel compensator arm. Rotate the motor 90 degrees and see that the five degree mark on number six cylinder firing lines up with the pointer on the flywheel. Loosen the two screws in the ends of the movable plate on



which the movable points are mounted. Rotate the movable plate between these two until the points just start to break. Lock the plates in that position. There is also a possibility that the points themselves are defective.



The little guy owns a midget racer, the big guy is his driver.

## BOOKKEEPING

Being interested in the ABC's of shop bookkeeping, we would like to know where we may obtain these books. Would you like to know what causes the shift lever on a Willys-Knight 20A to throw-out when riding along. Detjen's Service Station, East Ridgewood Ave., Paramus, N. J.

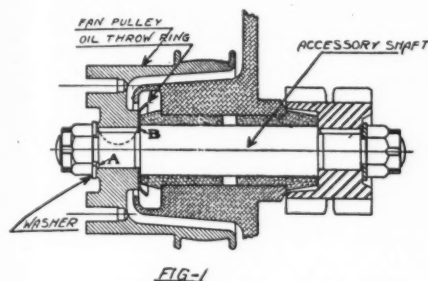
I CERTAINLY am glad to hear that you liked our series of articles on bookkeeping. All the necessary stationery in the form of books, etc., can be secured from any large stationer. I suggest that you get in touch with a stationery store in some nearby city and, if necessary, take a copy of the articles along so that you can show them exactly what you want. These stories were designed so that conventional forms could be used, which can be secured at any stationer's store.

The reason the Willys-Knight keeps coming out of gear is probably the result of worn gears. Bent shifting forks will also cause this, as will misalignment between the transmission and clutch. However, on a car as old as this, it is probably caused by worn gears within the transmission and I would suggest that you check the gears carefully for wear. While you have the transmission down, check for alignment of the clutch shaft and alignment between the transmission housing and the flywheel and flywheel housing.



## LEAKS AT FRONT END

I have a Studebaker Dictator Six, 1930 model, that leaks oil around accessory shaft next to the timing chain. I have rebushed it but this does not help any. Gasket O.K. It leaks only at above 45 miles per hour. O.K. under this speed. The breather is clean and car performs O.K. every way. If you can help me it will be appreciated as I have tried several sources for help on this. H. E. Shealy, Shealy's Garage, Ward, S. C.



I THINK the trouble on your Studebaker Dictator Six, that leaks oil around the accessory shaft, is caused by a loose oil throw ring at the front end of the accessory shaft.

When properly assembled, the oil throw ring should, of course, rotate with its shaft and the hub of the fan pulley should extend out beyond the shoulder on the accessory shaft. When this is the case, tightening the nut on

the end of the accessory shaft will insure that the oil throw ring is tightly compressed and will rotate with the shaft.

If the hub of the fan pulley does not extend out beyond the shoulder of the accessory shaft, I would install a 41 x 32 plain washer 1/16 in. thick against the end of the fan hub and then install the usual washer and castellated nut.

In addition to the foregoing, I would make sure that the oil return from the timing gear case into the crankcase is clear and permits the free return of oil.

## R & R CLUTCH

Have been getting the MOTOR AGE for the last 20 years and sure get a lot of good stuff out of it. Would like you to tell me the best way to take a clutch out of these new Chevrolets 1936-1937. Raymond Lauer, Lauer's Garage, 2217 Freepoint Rd., Natrona Heights, Pa.

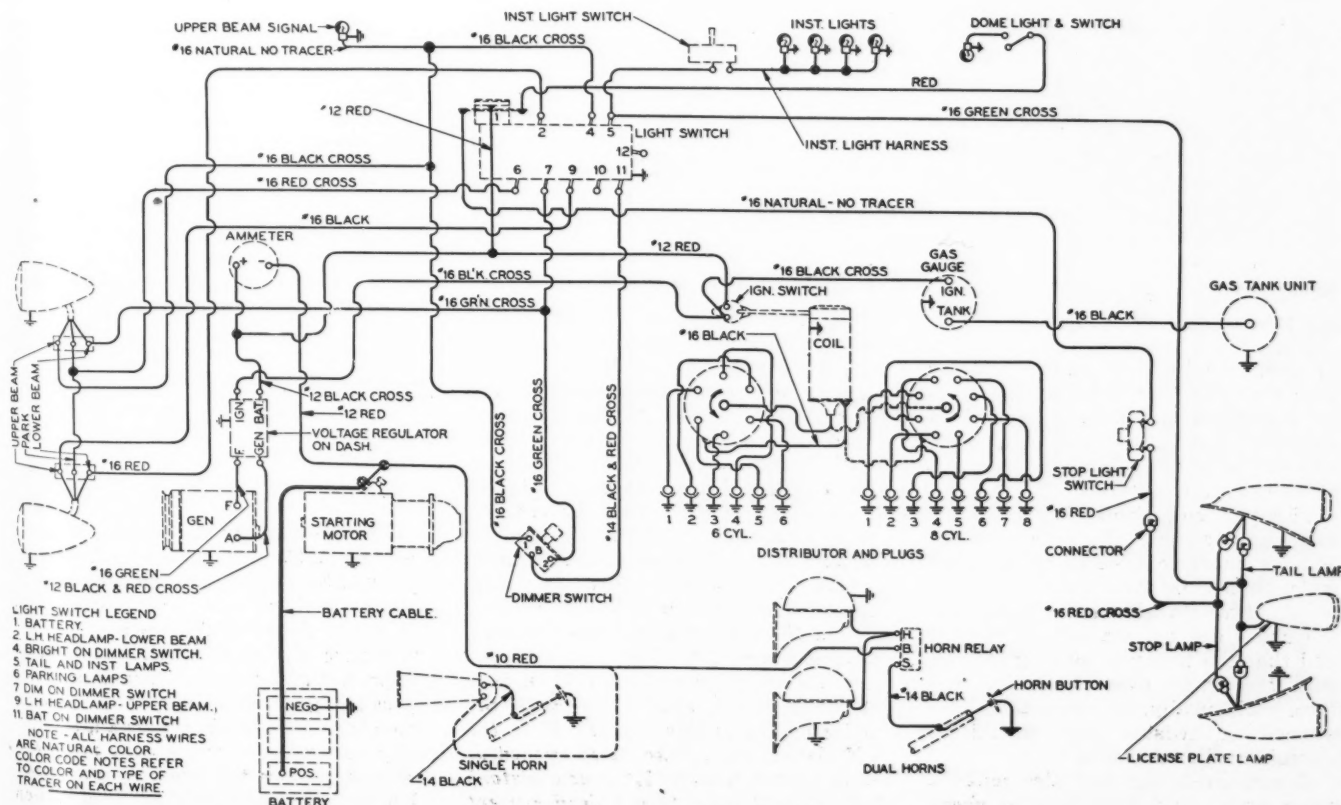
I AM mighty glad to hear that MOTOR AGE has proved to be of so much help to you in your business and before I take up your problem on how to remove a clutch from 1936 and 1937 Chevrolets, I want to tell you that we are always glad to help you on any particular problem that might come up in your business.

Now to remove the clutch on 1936

and 1937 Chevrolets, it is, of course, necessary to first remove the transmission. To do this remove the speedometer cable from the universal joint ball retainer and remove the hand brake lever from the frame. Then, remove the cap screws holding the universal joint ball collar and slip the ball and retainer back on the propeller shaft. Remove the nuts from the universal joint ring and split the universal joint. Remove the top cap screws holding the transmission to the flywheel housing and insert the two transmission guide pins in this hole. Remove the flywheel underpan and remove the two lower transmission to flywheel housing cap screws. Next, remove the bolts holding the rear transmission cross-member to the frame and remove the nuts holding this cross-member to the universal joint ball retainer and remove this part.

Lift the propeller shaft and slide the transmission straight back on the guide pins until the main drive gear shaft is free of the splines in the clutch disk. The use of two guide pins while doing this job will support the transmission and prevent damage to the clutch disk through springing.

Then, after removing the transmission, disconnect the clutch pedal pull-back-spring and the clutch pedal lever chain. Remove clutch fork off-set rod from fork. Remove the special cap screw holding the throw-out fork to the flywheel housing. Two wrenches



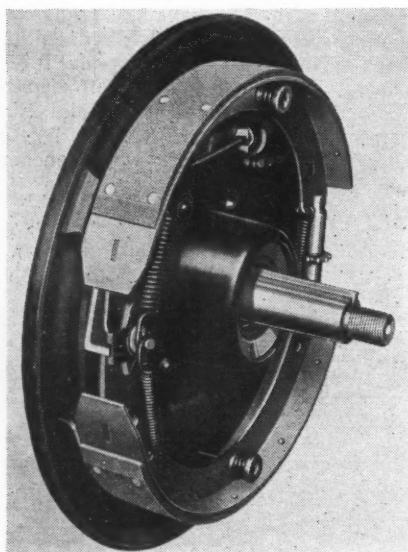
are necessary for this operation, one to hold the swivel on the fork and the other to turn the special top screw. Remove the throw-out fork and bearing assembly.

Remove the springs holding the throw-out sleeve to the throw-out levers over the ends of the levers and remove the sleeve. Remove the nine cap screws holding the clutch cover to the flywheel, backing off each screw until the tension is relieved from the cover. Then, remove the clutch and clutch disk.

## BRAKE NOISE

*I have a 1932 Pontiac V-8 and I have done everything that is possible to do and cannot cure the trouble. The front wheels will make a big noise when the brakes are applied. I have centralized the shoes and have installed new lining. This is the only car I have had so much trouble with. A Pennsylvania subscriber.*

**S**ORRY you didn't describe the noise you are experiencing on a 1932



Pontiac 8, as it would help me in trying to diagnose your trouble.

However, I would suggest that you go over the backing plates to make sure that they are tight on the steering knuckle and spindles assembly. In addition, make sure that your king pins are at least in fair condition and also the spring shackles.

This particular brake has two shoe-to-anchor springs. Be sure that the heavier one is connected to the shoe which hides or covers the operating lever. I would also make sure that the shoes are not warped or twisted and that the lining is making contact with the drums over the entire surface. Naturally, if the shoes are warped or twisted they should be straightened or replaced.

Grease on lining will also make a noisy brake and it is well to check this point even though you have just



"You'll have to grease your car later, daddy has a customer for a shave."

relined the shoes. As you know, the shoes should be held against the shoe guides by means of springs. In this connection, make sure that the brake shoe is lubricated wherever it contacts the shoe guides or backing plate.

Defective or poorly adjusted wheel bearings will also cause your trouble and, in this connection, it is well to check and double check your wheel bearing adjustment to make sure that it is not too loose.

Sometimes defective shock absorbers will also cause a noisy brake and in this connection you would do well to check over your shock absorbers, making sure that they are filled and operating correctly. This sums up the various possibilities that might cause a noisy brake and I would pay particular attention to warped or twisted shoes, that is assuming of course that you have adjusted the brakes correctly.

## PLANES OFF HEAD

*Being a reader of MOTOR AGE, I would like some information. I have a 1928 Buick Master, Model 55, and I have just raised the compression in this engine. First I planed the head 1/16 in. and then put in new pistons with higher heads, which are 1/4 in. higher from the wrist pin than the old pistons. In other words, the old pistons measured 2 3/16 in. above the wrist pin and the new pistons measure 2 7/16 in. above the wrist pin. Now what I want to know is how much I raised the compression. The old compression was 4.3. Now what is the new compression ratio in this engine? Another thing, should I change the valve timing in this engine? With the old pistons the intake valve opened at dead center, now with the new pistons why does it open before dead center?*

*How much difference would it make*

*in power if I change the valve timing to the old setting—top dead center—instead of before top center the way it is set now. Charles Roderick, Roderick's Auto Service, 464 Allen St., New Bedford, Mass.*

**W**ITH the changes you have made in your 1928 Master Six Buick, you have raised the compression ratio to 5.1 to 1. However, in doing so, the valve timing has not been changed. Regardless of how high you have built up the pistons they will still reach top center at the same time in the cycle as before.

While you might find some increase in power by changing valve timing, I do not think that it would amount to very much but, you will find it necessary to retard your spark somewhat over its original setting with a low compression head. Just how much the spark will have to be retarded you will have to determine yourself by trying the engine on the road.

The engine with the original compression ratio developed 77 hp. at 2800 r.p.m. I think with the new compression ratio which you have given it that it should develop about 85 hp.

## STUDEBAKER

### ENGINE SUPPORT

The engine rear support cross-member on 1937 Studebaker models 5A, 6A and 3C has been made heavier, the stock having been increased from 1/8 in. to 3/8 in. in thickness.

Where the engine rear support is clipped tight there is practically no possibility of breakage of the cross-member. Where such breakage actually occurs, however, it will be advisable to replace the broken cross-member with one of the latest type which can be ordered under Part No. 189254.



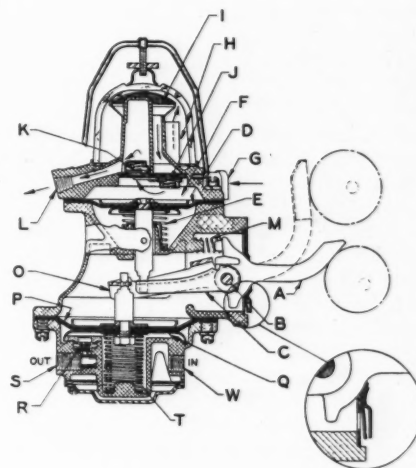
## FORD SHOP HINT

When removing the engine from 1935, 1936 and 1937 Ford cars, first place a large sheet of wall board directly behind the radiator core so as to protect it. Then remove distributor, generator and fan. Remove bolts around flywheel housing and disconnect exhaust pipe flange.

Remove combined water inlet pipe and engine front support on one side, and then remove support bolt from other side. With a chain hoist, move engine forward as far as it will go; this will permit splines to pull free and then by turning engine sideways it can be removed from chassis.

## VACUUM PUMP

On the 1936 Olds six there is a diaphragm beneath the fuel pump which is also connected by tubing to the intake manifold between number one and number two cylinders. At idling speed these cylinders did not work. Replacing the diaphragm cured the trouble. What is this diaphragm for? The Lewis Garage Co., Boothbay Harbor, Me.



THIS diaphragm acts as a vacuum pump and serves to keep the windshield wiper operating when the car is going uphill and the normal vacuum from the engine is low.

This combination fuel and vacuum pump is used on quite a few cars and you will find that when this vacuum diaphragm is cracked or broken that the fuel consumption of the engine increased to where you are lucky if you do 50 miles to a quart of oil. The reason for this is that the intake manifold vacuum is then directly connected with the crankcase of the engine with the result that oil is drawn directly from the engine to the fuel pump and into the intake manifold. Replacing this diaphragm overcomes the trouble.

In addition, in some few cases such as the Olds, it will result in misfiring of certain cylinders.

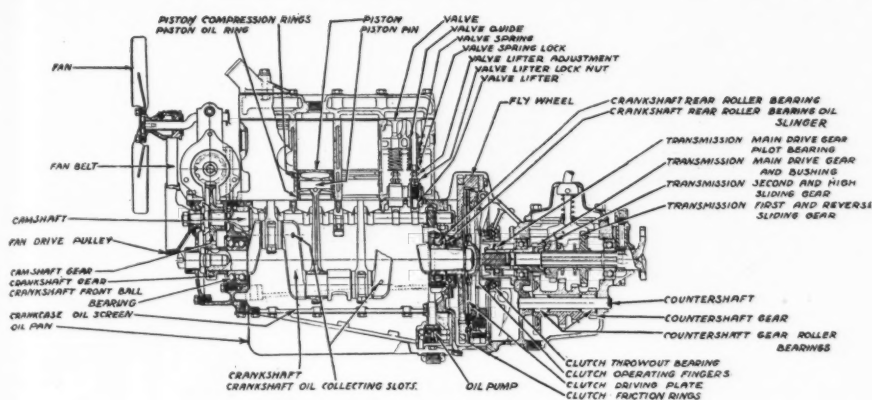


Fig. 1

## HOPPING UP AN AUSTIN

I have a 1931 Austin coupe on which I would like to increase the power. What changes would you suggest that I make in the motor?

Would a super-charger help to any extent on the "American Bantam"? They have increased the power by speeding up the engine. Is it possible for me to speed up the Austin engine and if so, how do I go about it? Peter Beyrent, 602 Luzerne St., Scranton, Pa.

YES, the speed of the 1931 Austin coupe can be materially increased by the installation of a super-charger. However, there is no super-charger made for this car in the United States and I would suggest that you write to the Austin Motor Co., Ltd., Birmingham & 479 Oxford St., W.1, London, England, as they can undoubtedly supply you.

However, if you do not wish to go to the expense of installing a super-charger, the performance can be improved materially by increasing the compression ratio. On this particular job, I would suggest planing approximately 3/32 in. from the cylinder head. In addition, I would suggest the installation of a new carburetor. If you contemplate using this engine for prolonged high speed driving, such as racing or in a motor boat, it might be advisable to install pressure lubrication. Of course, this is rather expensive as it will necessitate drilling the crankshaft and also the installation of a larger oil pump.

With regard to clearances, I would suggest that piston clearance be increased to approximately .003 in. and rod main bearing clearance to approximately .002 in. These increased bearing clearances will, of course, reduce friction and provide greater power.

## FLAT RATE

Why do you include the price of adjusting tappets in your tune-up operation F6 in the Chilton Flat Rate Manual? I think the operation would be of more use if it did not include tappet adjustment.

Also, I tried to find the calibration of carburetor used on the 1936 Gra-

ham on page 40 of the 11th edition of the Chilton Flat Rate Manual but could not find it. Oldershaws Automotive Service, 416 25th Street, Oakland, Cal.

THE reason that we include tappet adjustments in our tune-up operations is that a good job of tune-up cannot be done without adjusting tappets. However, if you wish to do a tune-up without including tappets, it is only necessary to subtract the price of our Operation L6 from the Operation F6 to obtain the price for tuning the engine without adjusting tappets.

With reference to your query about including the calibration of the Graham 1936 carburetor on page 40, this is quite true. However, you will note that we refer you to page 37 and not page 40. On page 37 we give details of construction and also the method of adjusting the various carburetors used on the 1936 Graham. The reason the calibration is omitted from the table on page 40 is that neither Graham nor Marvel had released that information at the time the Flat Rate Manual was printed.

## BUICK RADIATOR

On all 1937 Buick cars, radiator cores cannot be removed separately but must be removed as an assembly with the shell. The radiator grilles on all 1937 Buick cars can be removed without disturbing the core or shell. A large space is provided between the core and the grille to facilitate the removal and installation of the radiator grille holding nut.

## STUDEBAKER FLOOR BOARD

There has been some difficulty reported in removing the center piece of the front floor board on 1937 Studebaker cars equipped with a starter foot pedal. If properly performed, however, the operation should not require an excessive amount of time. It is necessary that the front seat be moved to its extreme rearward position, the center floor board can then be removed by turning it in a counter clockwise direction as it is removed.

**T**HESE are practical merchandising ideas that have been used by maintenance men—just like yourself. Workable ideas gathered from here, there and everywhere and presented for practical application to your business. Use them and write us your experience for publication herein.

By Harry T. Cooley

# SELLING

## Your Running-Board Manner

*This article appeared in the February issue of Exide News. It's so good we want all of you fellows to see it.*

They've got a twenty-cent word for it in the medical profession. They call it the "bedside manner." It is taught in all good medical schools. At least part of a doctor's success depends upon his "bedside manner."

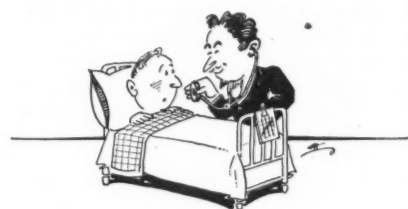
Now "beside manner" is nothing more nor less than salesmanship with all the fixings. It has to do with what the doctor says to his customers and how he says it. That "good-morning-how-are-you" smile that the doctor slips on as he comes into the sick room is his "bedside approach". That smile is important. It must not be too broad to be vulgar, but just broad enough to be pleasant.

His query: "How's-the-ol'-boy-this-morning?" is entirely unnecessary. He knows well enough how you are because he's just got through looking at your chart, and has probably talked to the nurse before he came in. Chances are that he has already ordered treatment for the next twenty-four hours.

But, nevertheless, he's got to ask "How's the sick man this morning?" It's part of his procedure. It's good salesmanship. If he didn't stop in and ask, you probably would think you were being neglected. Look at him feel your pulse. Boys, it's an art. That air of confidence and control of the situation would put a ship's captain to shame.

The stethoscope examination is awe-inspiring. The slightly knitted brow—the stare of concentration, and a

couple of self-addressed "h-m-m-m-s" are worthy of a Hollywood studio. That's high-class stuff—the real McCoy. To a doctor a stethoscope is as valuable as a whisk-broom is to a washroom attendant.



Here's a real merchant. He not only knows his pills, but he knows how to build up a frame of mind so the medicine will be most effective—that is, he knows his "bedside manner". He sells you good health by selling you confidence in him, in his ability to make you well. He also sells himself. You soon come to realize that were it not for him you would certainly have put your other foot in the grave. As it was, he put both of your feet back on good old solid earth again and you think he's the greatest guy in the world for doing it. So you tell your friends about him.

Salesmanship is about the same the world over. The same stuff that goes over at the bedside will go over at the



**Speaking of Identification!** The McNutt Battery Co. goes in for identification in a big way, using a 24-sheet poster as "atmosphere." The unusual and unique service car shown in the picture is used exclusively for uptown service and receives considerable attention scurrying through the streets on service calls. Congratulations on Mr. McNutt's ingenuity.



# SERVICE

running-board. There is no essential difference between good "bedside manner" and good "running-board manner" (windshield wiping to youse guys).

For example, by actual measurement there is no difference in the breadth of a "how-are-you" smile and a "fill-her-up" smile. And they are always worth while.

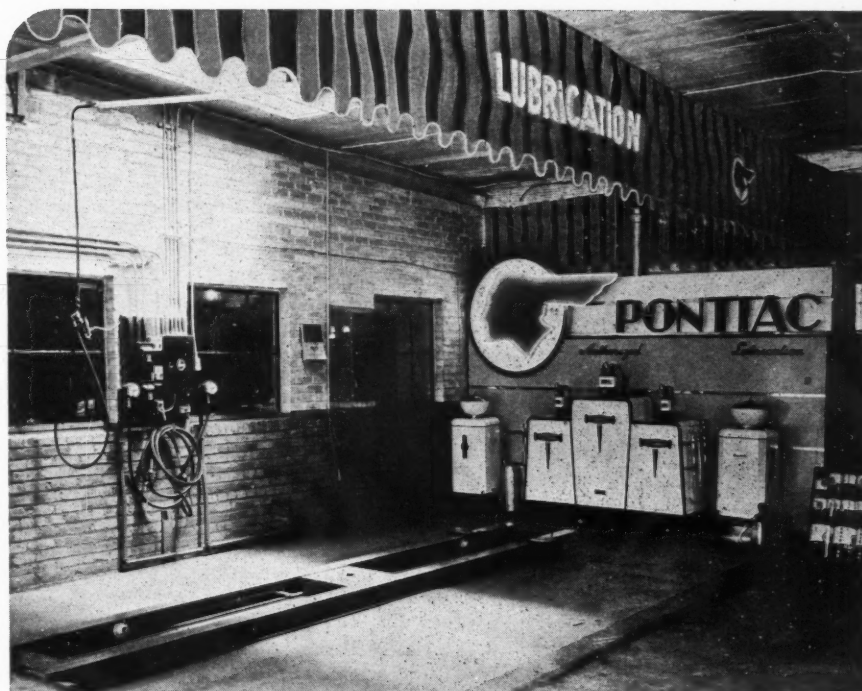
Likewise, a hydrometer can be used in stethoscope style—with the same knit of the brow—the same preoccupied stare and with the same self-addressed "h-m-m-s". The hydrometer is just as impressive an instrument as the stethoscope and just as informative.

Again, there is the art of how to go about finding out things you already know—asking questions the answers to which are known beforehand, in order to establish the fact that you are attentive, thorough and careful. Inquiry about ills long since cured is both good bedside and good running-board manners. They'll love it, and they'll pay for it, too, in continued patronage.

Study your doctor if he has a big practice. You can learn a lot from him. Of course, goatees and nose glasses with shoestring attachment are not recommended, but his "bedside manner" and your "running-board manner" shouldn't be far apart.

## What the Customer Likes

During Standard Oil's recent Service Survey, which was conducted for a period of six weeks, thousands of reports were received from motorists in several of the western states. Of the 122 motorists who were awarded prizes, the majority stated that cleaning the windshield by the gasoline dealer was the most important service for the safety, comfort and convenience of the motorist, while next in importance was having the tires inflated, then, checking the oil in the crankcase.



## Modern Lubrication Means Dollars and Cents

Service gross profits and total parts and labor sales were approximately quadrupled, while customer labor sales were increased six times and lubrication more than thirteen times after the installation of a modernized lubrication and service department at Rowley Pontiac Sales, Lansing, Mich.

That briefly tells the story of what a car dealer accomplished with modernized equipment linked with intelligent promotion. Many independent repair shops have done the same thing, but unfortunately they do not always have the figures available to show just how much their business has improved as the result of modern equipment. That is why we use the Rowley shop as an example.

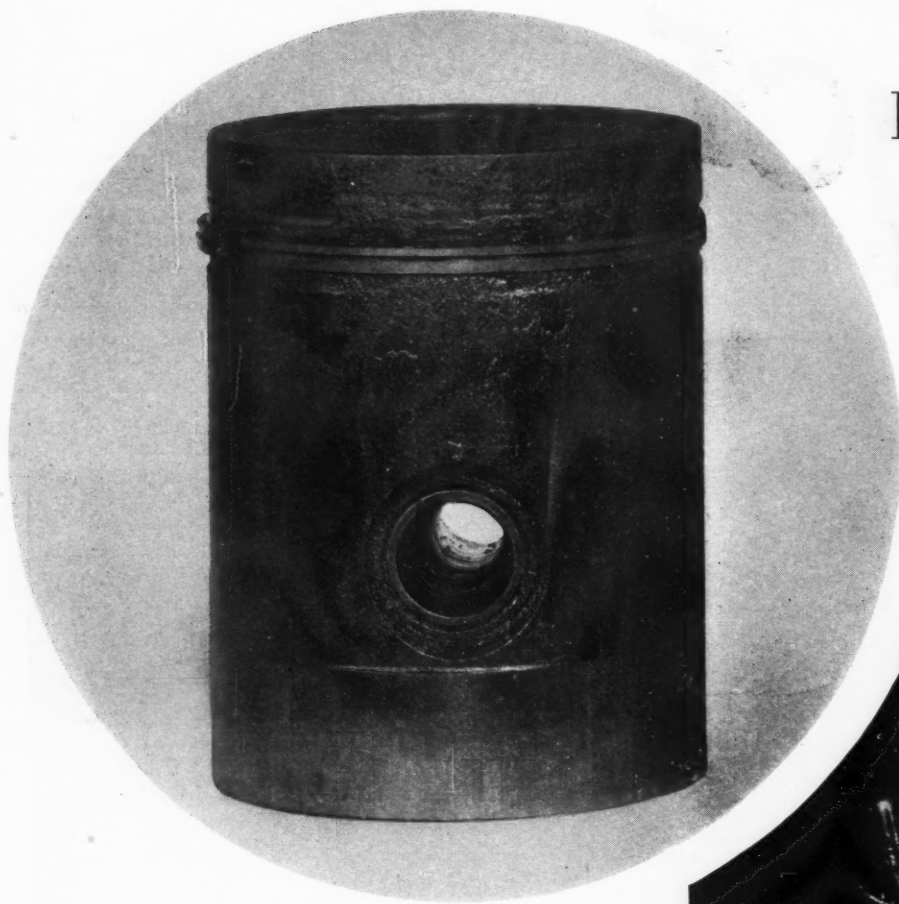
A complete service promotion installation was made about March 1. A program of obtaining additional service customers was built mainly around the modernized lubrication department with a lift and also a complete motor tune-up department which is operated by experienced men.

The regular "Pontiac Pointers" service advertising mailing pieces were used with great success. Also, a personal invitation from the dealer to each owner asking him to visit the station and inspect the new set-up met with a similarly good response.

The value of modernized equipment, linked with intelligent promotion and experienced mechanics, is evident in cold figures taken from the Rowley ledger. Any independent shop can do as well or better.

The table below shows the increase in work and profits resulting immediately after the installation:

	Before Modernization		After Modernization		
	Jan.	Feb.	March	April	May
Total parts and service sales	\$1,105.17	\$1,578.39	\$3,556.94	\$3,016.59	\$4,486.12
Customer Labor sales	300.04	511.63	1,261.67	1,738.72	1,943.59
Number of lubrications	31	38	275	372	426
Service gross profit	500.35	608.62	2,114.69	2,621.60	2,946.36
Per cent of service gross to fixed expense	40	38	78	92	101



## Do Your SLUDGE

**W**HEN a mechanic takes down an oil pan and finds it looking like the bottom of a cesspool, the first thing he generally does is start damning the oil. While it is true that some oils are more prone to produce sludge, actually the conditions under which the car is driven are of much greater importance. However, what to do about sludge is the question.

Sludge can cause the repair shop operator misery by sticking piston rings so that they fail to give an adequate piston-to-cylinder seal, by sticking valves so that they fail to seat accurately and promptly and in severe cases by plugging oil lines. However, the mere presence of a moderate amount of sludge in the oil pan is not evidence that sludge is doing any of these things. Whether or not sludge is causing loss of power and rapid wear of parts is something that each operator will have to decide for himself, taking into consideration the kind of service in which the car is being operated.

The word "sludge" seems to have two accepted definitions. Among refiners and lubricant technicians the word is synonymous for the hard, flinty substances that gather inside the engine. Actually this substance consists of a very hard material composed of particles of carbon held together with an asphaltene mixture which acts as a binder, next to the engine surface. Next is a semi-solid material of the same composition in the process of becoming a very hard solid, and

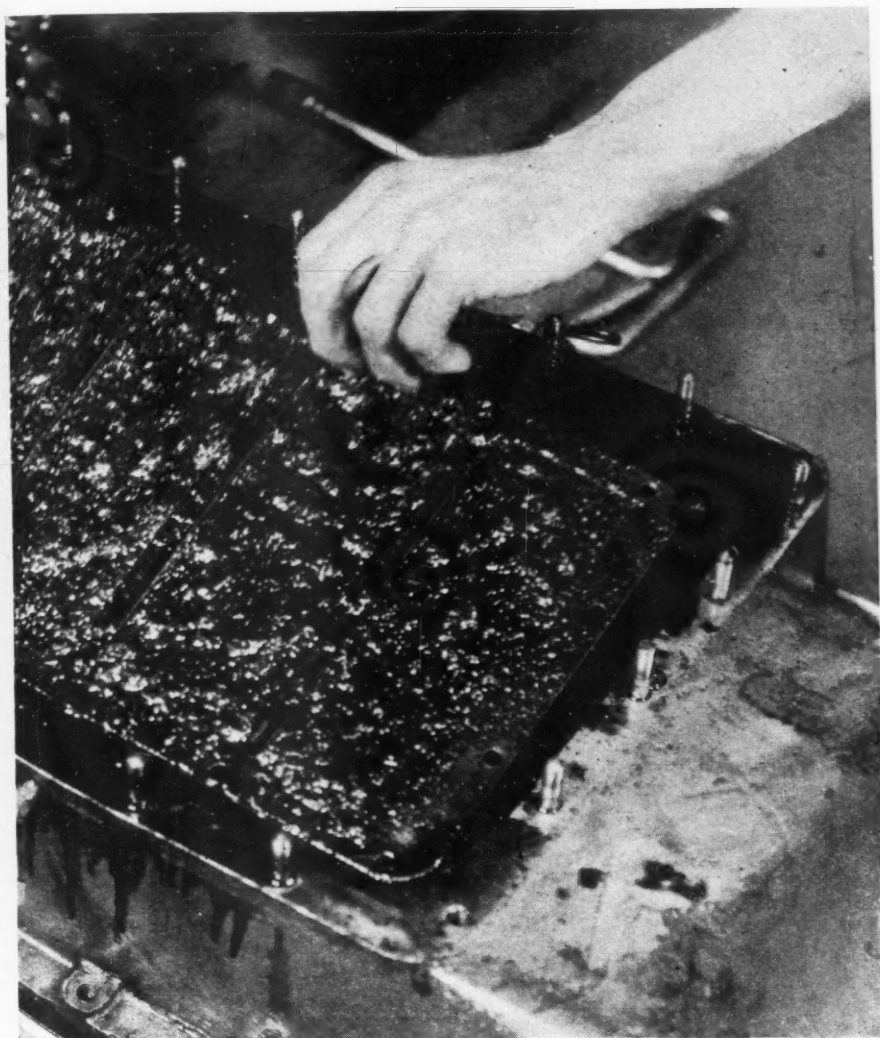
on top of that is a layer of dirty oil substance which is in the process of becoming semi-solid. The top two layers can be washed or scraped away easily, but the last layer sticks tight.

Repair shop operators look upon sludge as the mass of black impurities which gathers in the engine internals and will not flow. This substance is made up of refiner's sludge and an emulsion of water from condensation and the lubricant itself. All together it is





# **r** **E** Customers Have *in Their* PANS?



**BY**  
**HENRY JENNINGS**

densation of the air in the crankcase due to rapidly changing temperatures. Temperature control of the engine has a great deal to do with its sludging propensities.

The refiner's sludge is a product of oxidation or combustion. The chemical structure of the oil changes and asphaltenes are released that are insoluble in naphtha but which will dissolve in chloroform or benzine. These combine with carbon particles and form a dry sludge. There is only about 1/10 of 1 per cent of foreign matter in dry sludge. So long as this mixture forms in the oil pan no harm is done, but when it forms in piston ring grooves or on valve stems it will stop efficient functioning of these parts.

Discoloration of the oil in itself is not a symptom of sludge formation nor is it much of an indication that the oil has lost its lubricating quality. Oil heated to 200 deg. for 100 hours in a perfectly clean test tube will darken. Technically this is the first step in the transition from oil to some other substance, and therefore not desirable, but, practically, slight discoloration does not mean much to the repair shop operator. Oil that shows clear on a dip stick when used in an engine equipped with a good oil filter will be dark if drained and viewed in

*(Continued on page 78)*

a black gelatinous or mushy mixture. An analysis of this crankcase jelly has shown it to contain as high as 90 per cent water. It seems safe to assume that some engines are suffering from either or both kinds of sludge. It is also possible that some service managers are unduly alarmed over small amounts of either kind of sludge which may not be doing any particular harm.

The water which gets into the crankcase and causes the mushy mess gets in through the carbu-

retor in the form of hydrogen in the gasoline or as the result of leaks in the water jacket. When combustion takes place the hydrogen burns away to water, and with increased compression pressures a larger percentage of this water, that used to go out the exhaust system as steam, is forced by the increased pressure down past the piston rings, where it condenses in the crankcase and forms an emulsion with the crankcase lubricant. Added to this is the normal con-



Above are Norman Couch and his prize winning Texaco station, and to the right are some samples of the "human interest" ads with which he has attracted so much attention

# Make Them Laugh

**when they read your ad, and  
you will have them rolling into  
your shop for service**





BY HOLLISTER MOORE

**I** HAVE a cold in my head. If you know a good remedy for it drop in at my service station and tell me about it." That's the theme of one Norman Couch ad. Another tells how he missed a reward by shooting a stray dog away from his station—and yet another of how he tried to help a lady who was in distress. Mr. Couch uses the local weekly paper to talk to his customers—and those who might be. That is what he does; he talks to them as if they were in his station passing the time of day while buying gasoline, or having their cars greased.

As manager of a Texaco Certified Service Station on Northern Boulevard at 220th St., in Bayside, Long Island, Mr. Couch has made many friends in the suburb (Bayside is only twelve miles from New York City), and is doing his best to make more. He is proud of his station—and rightly so, as it won a Texaco award for being one of the most beautiful and outstanding in this section.

The idea of writing friendly little ads was born when a vacationing customer wrote to Mr. Couch from Vermont saying many nice things about a lubrication job that Couch's station had done before he started on his free-from-trouble trip. Receiving permission from the customer, Mr. Couch ran the letter as an advertisement. So

### It's A "Code, Code" World, Kerchoo!!

You'll hab to pardoned be this week, folks, I'b not a code id de head. I really should'ed hab id, but the trouble is I've bid triv'g too bedy "sure fire" rebedies suggested by fre'ds.

It is certai'ty fuddy how hedv people 'dough' how to get rid of a code id a head a'd yet id is fuddier how heddy bore peolpe go arou'd sayi'g "brst-kerchoo."

I've bid given at least ted rebedies for by code. The trouble is that by code was'ed so bad uttil I tried a few of these so-called cures. I berely sdeezed in frodt of a custober once a'd he was after me wid a "rebedy." The dext day id was worse a'd dow I ab havi'g a der rible tibe talka'g.

Subbody even suggested a balted bilk. I said, "Ub-yub-yub, balted bilk is good." But it dide'd work.

Eddway, I will welcob all rebedies. I ab will'g but weak, so if you hab a pet cure for a code id de head, I ab still at 220th Street and Northern Boulevard.

#### Norman Couch

THE  
TEXACO CERTIFIED  
SERVIC ESTATION  
Northern Boulevard  
at 220th Street  
Telephone  
BAYSIDE 9-7989

### "I Was Only Trying To Help"

"Service station" 'is the right moniker for my gas-dispensing establishment up on Northern Boulevard and 220th Street.

Recently a customer of mine came to me with a sad story about how a truck had smashed into her new car. Would I call the truck company up and talk to them good and forceful like? she asked. To make it even more forceful, would I say I was her husband who, by the way, was still in New York and couldn't be reached?

"Sure," I says, "watch me." And with that I'm on the phone giving them a piece of my mind. "My wife is terribly upset," I tell them. "Her new car is smashed up. Who do they think they are?" In a little while I get myself real worked up and I'm laying it on thick when the fellow on the other end says: "Pardon me, but who did you say you were?"

Well, believe it or not, I couldn't for the life of me get that name out. It had slipped my mind. By this time the truck company fellow is getting real persistent about getting my name.

"What's your name?" he says.

"What's the difference?" says

"Listen," he says, "you call me up. I didn't ask you to. You tell me our truck smacked your wife's car and now you won't give me your name. Are you crazy?"

"Skip it," I says, and hung up.

#### Norman Couch

THE  
TEXACO CERTIFIED  
SERVIC ESTATION  
Northern Boulevard  
at 220th Street  
Telephone  
BAYSIDE 9-7989

### "Keep Track Of Your Dogs"

One of my customers came in the other day and mentioned that he thought me very fond of members of the canine species . . . from poodles to pedigree pups.

"I am," says I, "but how did you know?"

"Well," says he, "there's always a large number of stray dogs congregating around your gas station."

He was quite right. There are always a rather startling number of stray poodles in and around my gas station (which by the way is located at 220th Street and Northern Boulevard) and there is a very good reason for the fact.

A long time ago a stray dog came to my gas station and made himself "to home". He was a nice pup but he was in a dangerous spot . . . always forced to dodge cars coming in and out, the way they have a habit of doing at Norman Couch's Texaco Station.

We tried every conceivable way to get him to go home for his own good and finally he left.

A day after the pup left up comes a customer and asks if we had seen a stray dog around the place. He describes the dog and he was the same one we had been week's trying to get rid of. The worst blow of all was when he tells me there's twenty-five bucks for the person who returns the pooch.

And that's the reason you'll find an uncommon lot of dogs around my place. I'm still looking for the pup that means a "quarter of a century" in my pocket.

#### Norman Couch

THE  
TEXACO CERTIFIED  
SERVIC ESTATION  
Northern Boulevard  
at 220th Street  
Telephone  
BAYSIDE 9-7989

many people noticed it and made favorable comments that he decided unusual things attract attention. "So many unusual things happen around my station," he said, "that I figured I might use my ads to tell about them in a human way, with just a hint now and then of what we are in business for. People liked the ads, and took the trouble to tell me they did, so I've kept it up. Every five or six weeks we play our joker by choosing an item of service to write about—but we follow the same style of presentation; we just answer questions that our customers ask us, or tell them of

something new. The last 'Business' ad or joker was on the subject of Marfax lubrication."

The Texaco Co. in its sales course tells the service men that people like to hear stories. Mr. Couch's ads fit right in with that idea.

Mr. Couch helped to explode the theory that grease racks have to be in the service station's "front yard". One reason for the beauty of his station is that the unsightly racks are out of sight at the rear. But doing a good grease job has kept them busy. A dignified sign points the way to "Certified Lu-

(Continued on page 76)



## Soap Box Derby Time 28.348 m.p.h.

**Bobby Ballard, White Plains, N. Y., Wins Fame and Fortune with \$9.82 Hand-Built Record-Breaking Job**

A trim little powered-by-gravity hand-built racer that cost \$9.82, a firm grip on the steering wheel, a clear eye and an abundance of pluck and grit brought both fame and fortune to 12-year-old Bobby Ballard of White Plains, N. Y., in Akron, Sunday, Aug. 15, when he won both the All-American and the International Soap Box derbies and set a new course record of 28.86 sec. for the 1200-ft. race or 28.348 m.p.h. He defeated a British South African boy in the latter.

For Bobby a four-year college scholarship in any recognized state college or university is assured through the Chevrolet division of General Motors Corp. in co-operation with more than 120 of the nation's leading newspapers. As first-place winner in the national event, participated in by 120 city winners over the United States, Bobby will, some six years hence, enroll in the University of Minnesota, by virtue of his splendid showing in the national event today. The northern school is Bobby's own selection.

In addition to the scholarship, Bobby also was awarded the first-place national silver trophy, the classically designed M. E. Coyle award. A diamond-set gold medal also was a part of the prize list for Bobby. As a special award for the national champion, whose speedy little racer dominated the juvenile classic throughout, the twelve-year-old youth received the Chevrolet silver trophy for the fastest heat of the day.

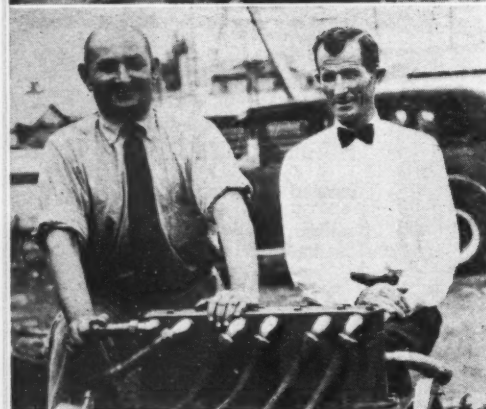
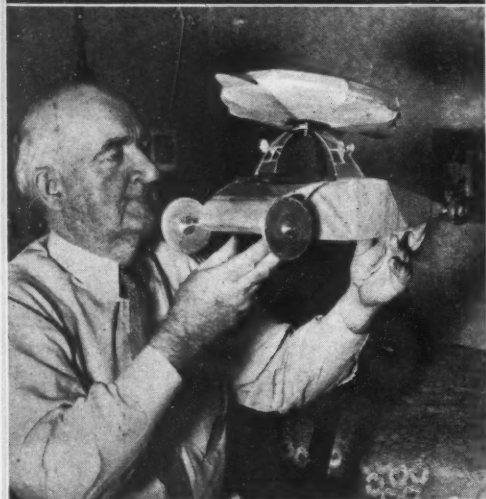
C. P. Fiseken, advertising manager of Chevrolet, presented the derby prizes at a banquet which followed

the races. Each of the 20 derby contestants—each a champion over hundreds of boys in his home city—was given a prize.

## Plymouth Plant Reopens

Some 20,000 automobile workers in three plants returned to their jobs Aug. 9 after the Plymouth local of the United Automobile Workers voted to accept an agreement reached late Saturday between union and Chrysler officials. The pact, ratified by an estimated 2000 UAW members Sunday afternoon, permitted resumption of operations by the Plymouth plant, closed Aug. 14, when a riot took place between members of the UAW and the Independent Association of Chrysler Employees. The resultant shut-down of the Plymouth plant was followed by closing of departments at the Briggs Mfg. Co. involving 7000 employees and departments in the Dodge plant engaged on Plymouth work and involving over 2000 employees.

Terms of the agreement were not disclosed, but the main issue in the controversy was the demand of the union for the return to work of four of its members discharged for fighting. The management agreed to hear the cases of these men and hearings were begun Aug. 10 before Herman L. Weckler, vice-president in charge of industrial relations for the Chrysler Corp. The UAW men were represented by Larry Davidow, a union attorney, and Leo Lamotte, president of the Plymouth local.



### Down the Column:

**"Grease 'em But No Wash Job."** says Bobby Carroll, of Chicago, and Art Haas, finding Bobby's skates have grease fittings, obliges

**It Lets You Down Easy** Edwin Rice is holding a model of his flying auto. By turning a crank in an emergency the pilot can spin the circular wing to produce the effect of an autogiro

**Not Hot Air** Obid Munroe, of Miami, invented this compressed air motor which will operate on only five pounds of pressure. The inventor and his backer are shown with their hands on the motor while it is running

**Soap Box Champ** Twelve-year-old Bobby Ballard of White Plains, N. Y., was a tired but happy lad as he told his dad just how he breezed home the winner of the All-American Soap Box Derby at Akron

**Nautical Bicyclist** Nadine Prescott preparing for the aquatic cycling event which was one of the features of the recent Water Circus at Long Beach, Cal.





## Independents Raise Car Prices

*Move Now Quite General Excepting Chrysler Whose Action Is Expected; Cost Rises Partly Covered*

Three independent automobile manufacturers have announced price increases on 1937 models, following the Ford and General Motors moves. Chrysler divisional increases are expected in the very near future. Partial coverage of higher costs is given as the reason.

Packard distributors and dealers were notified of price increases effective at midnight Aug. 16. The "Six" was to be raised \$65; the "120," \$65; the "Super Eight," \$150, and the "12," \$200.

Nash and Nash-Lafayette cars were advanced in price Aug. 14. On the latter the increase is \$35. The Nash "Ambassador Six" went up \$65 and the "Ambassador Eight," \$85. C. H. Bliss, Nash-Kelvinator Corp. vice-president, announced the suspension of assemblies so that the company's \$2,000,000 plant improvement plan can be completed. Production facilities will be doubled at Kenosha, Racine and Milwaukee, Wis. He reported Nash registrations for the first half of the year at 41,698 cars, a gain of 82 per cent over the 1936 results.

Prices of Hudsons and Terraplanes were increased on Aug. 23, according to William R. Tracy, vice-president in charge of sales of the Hudson Motor Car Company. The increases, Mr. Tracy stated, ranged from \$35 above the present list price on the Terraplanes up to \$45 on the Hudson cars. "Practically every product entering into the manufacture of our cars, including wages, has risen substantially in price," Mr. Tracy stated. "Naturally this affects the price."

The Chevrolet price increase, effective Aug. 9, was \$30 on all passenger and commercial car models, and on trucks. Pontiac raised its cars \$45.

Ford Motor Co., Ltd., Canada, announced price increases ranging from \$21.21 to \$43.16 delivered at East Windsor, Ont., tax included, freight extra. On all models of the "60" series, the increases were in the higher range, making that line sell at \$730.04 to \$905.80.

Excepting for the "85" coupe, which was raised \$21.21, increases ran more and up to \$32.96. The range is now \$795.81 to \$940.95. In the "85" de luxe line the increases were nearly \$33 per model and the range is now \$869.01 to \$1,005.78.

The "60" coupe was unchanged at \$730.04 and several de luxe small-production models were unchanged.

## The Tortoise and the Hare

Police Captain Johnson of Indianapolis has completed an interesting survey, which shows that more cars can be safely moved past a given point in an hour's time at 23.5 m.p.h. than at any other speed. The reason, according to Capt. Johnson, is that only 33 feet is needed between cars and 2600 an hour can be handled safely, whereas, at 25 m.p.h. 37 feet is required and only 2595 cars will pass. As the speed is increased the distance between cars must be increased in even greater proportion, thereby cutting down the speed of the group as a whole.

### Down the Column:

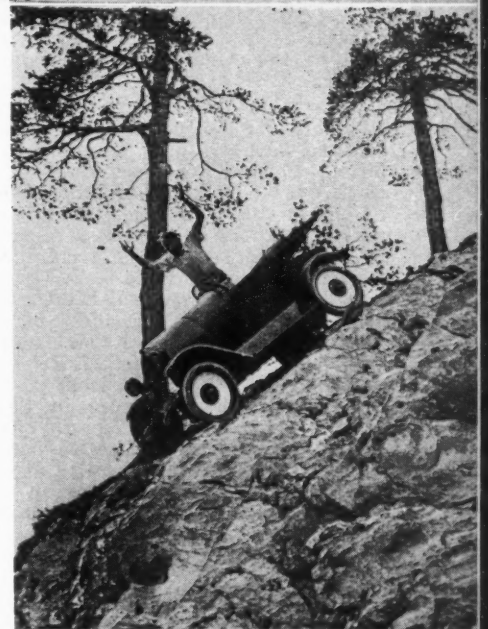
**Unfair** Wearing the sign shown above, the sandwich man went on parade for "bum batteries," drew a big crowd and lots of business

**Or "Take Your Time"** This realistic warning to be careful confronts automobilists on the summit of the Simplon pass in Switzerland. It is 6582 feet above sea level

**Rolls His Own** C. Elverson, of New England, and his brother built this interesting and unique car to their own design. It is driven by a motorcycle engine mounted at the rear

**Two Out Of Three** This picture was made a moment after two racing cars crashed on the most dangerous turn of the Lakewood track at Atlanta, Ga. The machine driven by Phil Lacatier has burst into flames

**Speed King** Sir Malcolm Campbell, shown with his wife, just before he made a new world's speedboat record of 126.25 M.P.H., beating Car Woods record of 124.86 M.P.H.



## Competition for UAW Expected

*Alliance of Independent Unions and New Drive by AFL Seen  
Factors in Status of Automobile Organization*

Growing competition for the United Automobile Workers union is seen in recent developments in the labor world which suggest that the coming year may be marked by inter-union struggles with less pressure on employers. One thing is quite apparent. The UAW and its parent organization, the CIO, are fast losing much of the arrogance that characterized their sudden rise to power during the past year when there was little or no opposition from competing organizations in the automotive field. But now it is beginning to appear that the UAW will face formidable competition in the form of a union of independents as well as in greater activity on the part of the American Federation of Labor.

Last week in Detroit, representatives of 30 independent labor unions selected members of a planning committee which is to meet Aug. 21 to work out an alliance of independent unions in such a manner "as to gain national expression and recognition." Principal speakers at the preliminary meeting last week were J. J. Griffin, president of the Tool and Die Craftsmen; W. E. Evans, president of the National Coalition of Labor Organizations, Inc.; and Daniel M. Robbins, president of the American Labor League with headquarters in Saginaw. The independents feel the need of a national organization to obtain proper recognition. Delegates at the meeting claimed a membership for their organizations of approximately 70,000 and that the prospective alliance would represent 150,000 workers.

This week in Flint, the American Federation of Labor opened regional headquarters announcing the appointment of Raymond W. Bellamy of Washington, former Federal director of employment for Maryland, as director. Bellamy started immediately to enroll automobile workers and predicted that the Independent Automobile Employees Association, recently organized in Flint and claiming several thousand members, would become an affiliate of the AFL. A few months ago the Federation opened an office in Toledo for organizing automobile workers.

Meanwhile in Milwaukee, lines are being drawn for the battle on the convention floor between factions within the UAW. President Homer Martin has the support of both sides for his reelection but the factions are sharply divided on other issues, such as centralization of control, greater autonomy for locals, size of the executive board, political action and the reelection of certain officers. On Martin's side in the so-called "progressive group" are Richard T. Frankenstein, organization director, and Walter N. Wells, third vice-president. They are seeking to oust vice-presidents Ed Hall and Wyndham Mortimer, leaders of the "unity party," which has the support of Walter Reuther, board member and president of the West Side Local in Detroit.

The convention will get under way

in Milwaukee Aug. 23 with both factions claiming a majority of the 1500 or more votes of delegates expected to be present. The executive board has been in session two weeks, drafting recommendations on constitutional amendments and other questions. One subject which is certain to be debated at length is that of outlaw strikes and the disciplinary problem they have raised.

### **Paul Hileman General Manager of Jadson Products**

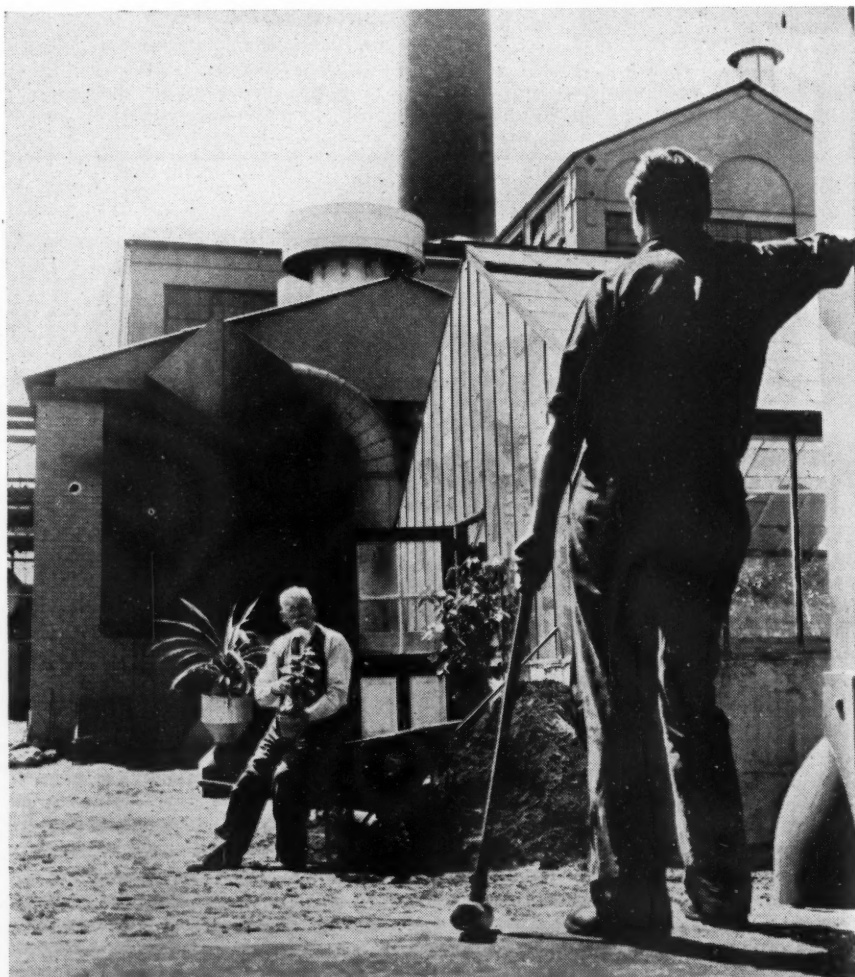
Announcement of the appointment of Paul D. Hileman to the position of general manager of the Jadson Motor Products Co., Bell, Calif., was made this week by L. M. Clegg, senior vice-president of Thompson Products, Inc., Cleveland and Detroit, the parent organization.

For the last nine years Mr. Hile-



man served as Detroit representative for Thompson Products, working with car manufacturers on engineering and production problems. He is a member of the Detroit Governing Board of the Society of Automotive Engineers.

**Right in the Middle of the Works** For 17 years Gavin Bruce has tended this greenhouse, which is located in the very heart of the big Chevrolet plant in Flint. Bruce has four sons, four sons-in-law, and five grandchildren who help build Chevrolets.





## More Power from Pressure Fuel Feed

"With improved fuel mixture preparation it is possible to secure 150 pounds or more brake mean effective pressure, resulting in tremendously increased engine output with an actual gain in smoothness," says David E. Anderson, Chief Engineer of the Bohn Aluminum and Brass Corporation. "We have come to have an entirely new conception of what is necessary to improve engine design," says Anderson. "For years it has been an axiom among motor engineers that increased torque and power is accompanied by engine roughness.

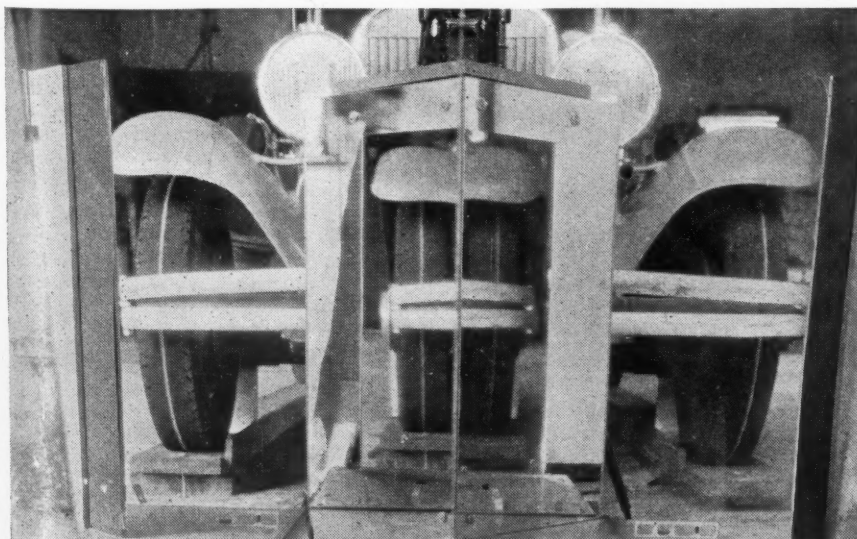
"As a matter of fact, we now find the reverse is true. We have just completed a test in the Bohn laboratory with a Supercharger attached to a well-known popular engine. The results of which are almost unbelievable. Using the standard carburetor and intake manifold, the highest Brake Mean Effective Pressure ever obtained from this engine was 123 and this accompanied by roughness and detonation too great to be considered commercial.

"Upon applying the Supercharger, using the standard 6.5 to 1 compression ratio, the B.M.E.P. was increased from 118, which is commercially acceptable, to 136. The maximum torque was increased from 160 to 186 and the maximum horsepower from 93½ to 125 at 4000.

"From this test and other observations made during the last five years in connection with our cylinder head research work, we have found that one obstacle, proper gasification, preparation and distribution of the incoming charge, prevents us from using a maximum efficient compression ratio of approximately 8½ to 1.

**It's Done With Mirrors** An entirely new method of aligning wheels and which employs a series of reflector devices has been developed by Andre J. Mathieu, 401 S. W. 8th St., Miami, Fla. The car is driven in front of a series of reflecting devices that put the two front wheel reflections on a graduated glass which shows at a glance the amount of misalignment.

In other words, the reflecting device places the image of the two front wheels side by side so that camber can be easily compared. Patent has been applied for on the device and Mr. Mathieu states that in the past two months he has done more wheel alignment work than he has done in the previous year.



"From our investigations to date, we believe that this obstacle can be overcome by means of a fuel injection pump of a type which compresses a rich mixture at a pressure of about one thousand pounds per square inch before being introduced in the combustion chamber. This rich mixture, too rich to self ignite, would then combine during its admission to the cylinders with the air introduced into the cylinders either by suction or by means of a Supercharger, thereby, obtaining the proper air fuel ratio. This would result in a smooth engine, free from detonation with a torque and power output far in excess of anything commercially available today.

"To put the matter frankly, the problem is right in the lap of the carburetor engineer. Fundamentally there has been no change in carburetion in thirty years."

### "Wingfoot Clan"

#### Celebrates Silver Jubilee

The *Wingfoot Clan*, a factory newspaper published by the Goodyear Tire and Rubber Company at Akron, celebrated its 25th anniversary on June 1. It is believed to be one of the oldest publications of its kind in the country.

### Radio Antennas

#### For All Cars

The advent of the steel top made necessary a completely new line of radio antennas. The Ward Products Corp., 1523 East Forty-fifth Street, Cleveland, Ohio, has a complete line of under-car, roof-type and "fish pole" or "buggy whip" types of aerials for every installation. Write for complete catalog.



**Frank Tighe**, who was managing editor of *MOTOR AGE* since 1935 and prior to that held a similar position on the *Automobile Trade Journal*, has joined the staff of Roche, Williams & Cunningham, Inc., advertising agency of Chicago. Frank will devote most of his time to the Studebaker account in South Bend.

## MOTOR AGE

September, 1907

### 30 Years Ago

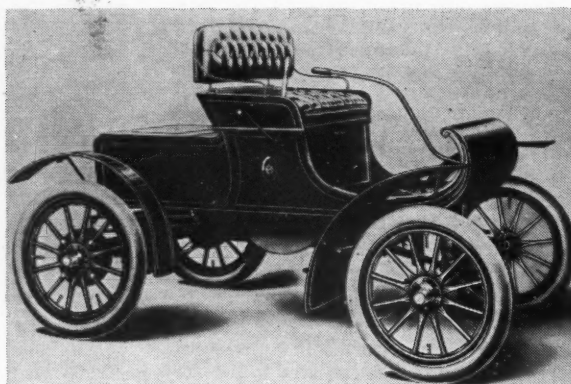
New York Registrations—New York registrations of cars during August were 1,196, a gain of 120 over 1906, the leaders being: Ford, 137; Maxwell, 79; Cadillac, 66; Oldsmobile, 44; Pope, 40; Reo, 38; Buick, 34; Pierce, 27; Packard, 21; Locomobile, 19; Thomas, 19, and Ranier, 18. Sixty-three foreign cars were registered. Up to Sept. 1 the total New York registrations were 46,974, of which 13,747 were registered since Sept. 1, 1906.

*Editor's Note*—In 1936 there were 2,453,542 motor vehicles registered in New York.

Phila., Pa.—The Pennsylvania railroad is about to go into the motor car manufacturing business. It is the intention of the company to make motor cars in the Juniata shops in Altoona and to use them in its cab service in place of the old hansom.

Pikes Peak or bust is a familiar phrase, handed down from the days of the old prairie schooner, but it is becoming applicable to motoring now that the record-breakers have turned their attention to Colorado's famous mound. The feat of F. W. Leland in climbing to the top with a four-cylinder Stearns carrying a full complement of passengers is one well worth recording and emulating as well. This climb surely ought to test a motor's power and at the same time call to the attention of the world at large the possibilities of the modern motor car. There are few things left for the motor car to attempt and every fresh indication of its prowess is a step forward on the job of convincing the doubting ones.

**OFFICIAL** description of the first Oldsmobile stated that "the machinery is very simple, not even a counter-shaft being used in its construction; it is practically noiseless and impossible to explode, as the fuel supply is below the engine."



## Olds Has Fortieth Anniversary

**Formed Aug. 31, 1897, to Build One Carriage; Built 2500 In Its Fifth Year; Famous Names Appear in Its History**

"To build one carriage in as nearly perfect a manner as possible," was the authority given the head of an automobile company formed just 40 years ago, Aug. 21, 1897. That company, formed on that date, is now Oldsmobile. By its fifth year, production was 2500 cars.

The company's own description of its first automobile was as follows: "Underneath the box, and in every way independent of it, is a 5 h.p. gasoline motor, which in operation makes scarcely any vibration. The vehicle is steered with the left hand. The lever at the right of the buggy, when thrown forward, throws in the back gear; when turned in the opposite direction a fourth of a turn it throws in a four-mile speed, which is used for rough roads and hill climbing. If higher speed is desired another quarter turn gives eight miles an hour, still another is 12 miles an hour, and if still greater speed is desired the speed is increased at the

governor of the motor and as high as 18 miles can be obtained."

These first curved-dash Oldsmobiles went all over the world, becoming the property of crowned heads of Europe and small town merchants alike.

Many of the outstanding figures of the automobile industry have been at one time or another connected with the Oldsmobile company.

The Dodge Brothers laid the foundation of their fortune through an order for 2000 transmissions placed with their little machine shop by Oldsmobile. In the same manner, the Cadillac Company, headed by Henry M. Leland, attributed its early growth to an order for 2000 engines, placed by Oldsmobile with the Leland-Faulconer Company, of which Leland was president.

Ransom E. Olds, from whom Oldsmobile derived its name, later organized the Reo Motor Car Company. The late C. B. Wilson, recently prominent in the Willys organization, was

responsible for organizing the Oldsmobile factories for their production of early days.

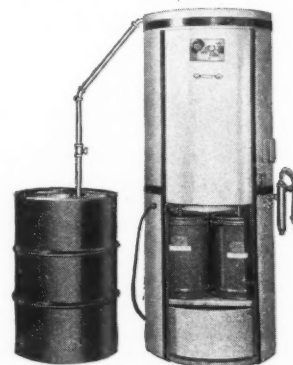
Roy R. Chapin, F. O. Bezner, Howard E. Coffin, R. B. Jackson and J. J. Brady were associated with Oldsmobile before they established the E. R. Thomas Company at Detroit. This company later became the Chalmers Company, and afterwards four of these five men started the Hudson Motor Car Company.

Ralph M. Owen, one-time factory manager of Oldsmobile, left the company to produce the first Owen car and later the Owen Magnetic. R. C. Hupp resigned his position as service manager of Oldsmobile to organize the Hupp Motor Car Company.

W. C. Durant acquired Oldsmobile for the General Motors Company (later the General Motors Corporation). C. W. Nash, who later formed the automobile company which bears his name, was once president of Oldsmobile.

## Oil Reclaimer Saves Money

At a cost said to be less than 7 cents per gallon, the Brace Oil Reclaimer, made by the Brace Oil Equipment Co., 234 North Broadway, Milwaukee, Wis., will reclaim old oil drained from



crankcase with an entirely automatic operation. All that is necessary is to pour the old oil in the storage tank located outside of the machine, and turn on the switch. Reclaimed oil is pumped out of the machine by hand, free from impurities and completely restored for normal use.

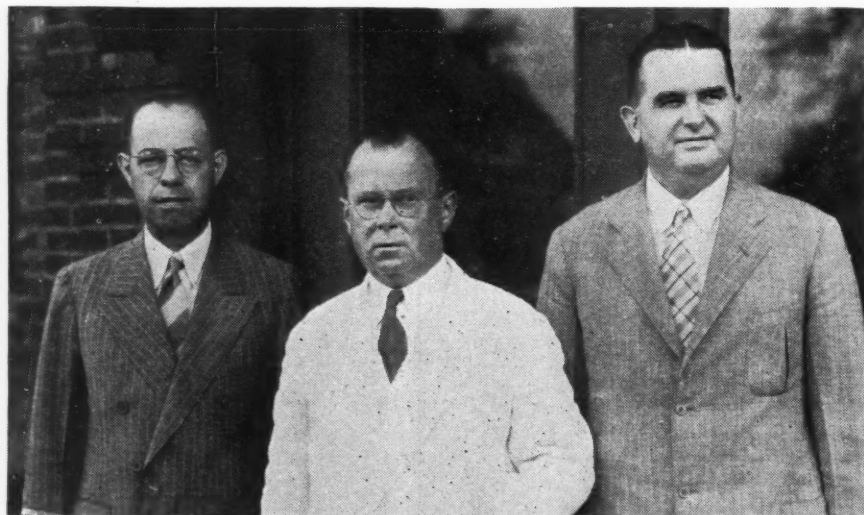
## Ford Wins Slow Speed Race

An automobile race with reverse English, but not in reverse gear, recently amused crowds that attended a municipal festival at Havana, Cuba. The winning car, a Ford V-8, took almost an hour to cover approximately a third of a mile.

The object in this competition was to see how slowly the cars could cover the specified course without stalling engines, for which the penalty was disqualification.

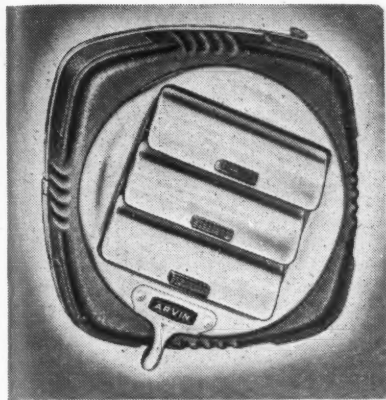
Two Ford V-8s with 60-horsepower engines, settled down to deliberate work and proved themselves to be the best "snails" in a place where it paid to be snail-like.

The Fords took first and second prizes, using 57 minutes and 12 seconds and 56 minutes and 12 seconds, respectively, to travel over the 547-yard course, which was a straight, asphalt highway.



**To Speak at USL Conventions** These men are bringing the new USL merchandising and advertising program to USL jobbers and their salesmen at District Sales Conventions being held during the latter part of August in Chicago, Minneapolis, Omaha, Atlanta, New York City and Niagara Falls. Left to right:—W. E. Blank, USL Sales Manager; R. T. Pierson, USL Vice-President and General Manager; E. D. Giaque, Vice-President Baldwin & Strachan, Inc., USL advertising counsel.





### Arvin Heaters for 1937-38 Cars

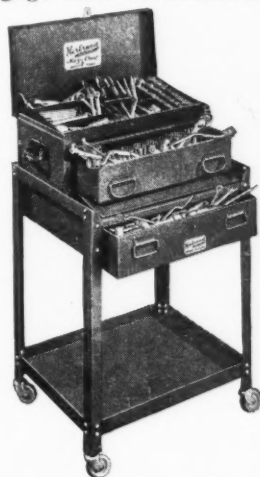
A new line of hot water heaters known as Series "F" has been announced for 1937 and 1938 cars by Noblitt-Sparks Industries, Inc., Columbus, Indiana. Features of the new heaters are Arvin's entirely new high-heat-wave, triple-tube radiator core, incorporating the defroster and foot-warming principle. The complete line includes ten models finished in taupe and chromium, and at prices ranging from \$9.95 list up to \$22.95 list. Double and single defroster fittings for cowl openings are packed and sold separately.

#### Rusco Chart

A flat rate chart, 17 x 28 in., printed in red and black, and recommending the use of Rusco 77 and Rusco 77A brake lining, has been made available to all Rusco service stations by the Russell Mfg. Co., Middletown, Conn. This chart shows not only the proper combinations of brake lining for each job, but also shows a recommended flat rate price including labor.

### Rollway Workshop For Mechanics

A new combination tool set and portable workshop has been developed by the Herbrand Corp., Lake and Stone Streets, Fremont, Ohio. It consists of a tool chest containing 101 essential tools, mounted on top of a heavy gage steel workbench equipped



with casters to make it easily portable. The bench is 31½ in. high by 23¾ in. wide by 19 in. deep, and has a 6½-in. work ledge in front of the tool chest. Both the Rollway Workbench and the Magic Chest are attractively finished in baked blue wrinkle finish.

MOTOR AGE, September, 1937

## Pierce-Arrow to Add \$1200 Car

### Chanter Announces Financing Program

The Pierce-Arrow Motor Corp., Buffalo, N. Y., will again enter the medium price car field with an automobile which is expected will sell around \$1,200. There are some indications that the company will follow this with the manufacture of a car to sell at about \$1,000.

Financing arrangements have been made and about \$11,000,000 for new equipment and working capital will be raised by the sale of stock to underwriters, according to A. J. Chanter, president of the company. It is understood that the Marine-Midland organization in Buffalo will have a major interest in the underwriting and that New York investment bankers will also be members of the group.

Mr. Chanter's statement said, in part: "During the depression the 'fine' car market shrank heavily for all manufacturers. Although returning prosperity has brought some degree of recovery in this field, the pronounced improvement in passenger car registrations has been in the medium priced field where fine performance and workmanship formerly associated only with cars in the several thousand dollar class have been coupled with prices within the reach of a greatly increased number of people.

The percentage of passenger car registrations in the \$700 to \$1,400 field was only 11 per cent of total registration in 1933. This figure increased to 31 per cent in 1936 and to 34.9 per cent in the first five months of 1937.

The addition of a medium priced Pierce-Arrow car, for which present distributors have indicated a tremendous demand, to the higher priced Pierce-Arrow and the trailer lines will make possible very profitable operation of the company's plants.

### Olds Prices Up \$45

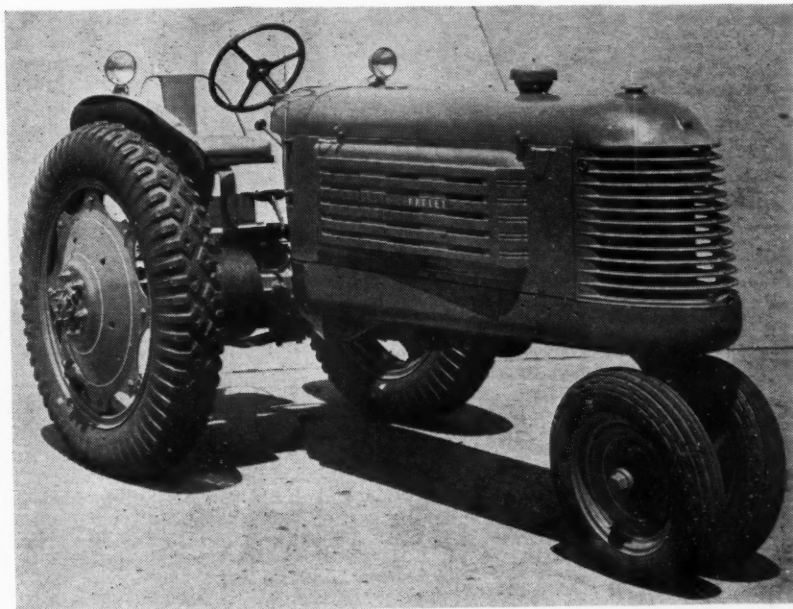
Increase of \$45 in the price of all Oldsmobile models, has been announced.

"The increase in Oldsmobile prices at this time partially reflects the rise in costs of labor and material that has been experienced during the past six months," said D. E. Ralston, Oldsmobile general sales manager.

### Kendall Refining Co. to Sponsor John B. Kennedy in News Talks

Kendall Refining Company will sponsor John B. Kennedy, noted commentator, for a series of twice weekly broadcasts over NBC Station WJZ, beginning September 14. The program will be broadcast Tuesdays, from 7.45 to 8.00 and Saturdays from 6.45 to 7.00 P. M.

Kennedy, crack NBC political analyst and news commentator, is noted for his curt, direct, breezy manner of speech. A former associate editor of Collier's magazine, Kennedy set something of a record with his prolific output of interviews and short stories.



**New Tractor** known as the Graham-Bradley which has been announced by Graham Paige Motors Corp. and is to be marketed principally through Sears, Roebuck and Co.'s retail stores. Designed to accommodate farm implements made by the David Bradley Mfg. Works, Sears subsidiary, the new unit is said to be capable of pulling a two or three 14-in. bottom plow at 6.2 m.p.h. through any soil in high gear. The power plant is a 6-cyl., L-head type engine which develops 35 hp. at 1400 r.p.m.

## Vulcanizing Plant

### In One Mold

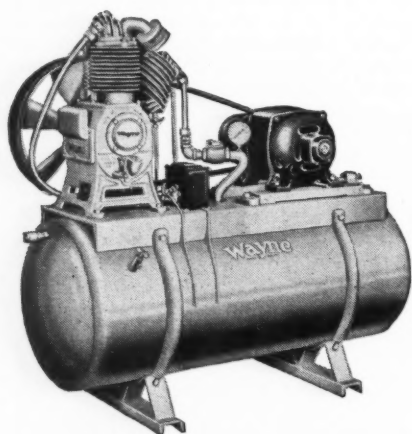


Chase Mfg. Co., 3216 Delmar Boulevard, St. Louis, Mo., has announced an automatic electric steam tire vulcanizing plant which will take all tires from 4.50 to a 32 x 6 high pressure tire, or from 5.00 to 7.00 balloon tire, and any rim size up to 20 in. The machine is carefully finished at the top and bottom of the cavity so that reducing shells fit perfectly, eliminating air pockets and making a thermal contact to insure equal heat distribution. Sold with a 30-day money-back guarantee.

## Large Capacity

### Air Compressor

The problem of buying an air compression that will be of sufficient capacity to handle increasing loads from time to time as additional air equipment is added to the shop has been solved by the introduction by the Wayne Pump Co., Tecumseh and Cochran Streets, Fort Wayne, Ind., of their Model W-276 compressor. While rated at 7½ cu. ft., it is actually a 14



cu. ft. compressor except in horsepower. Large enough for the average shop now, if need for expansion later is experienced it is only necessary to purchase a new motor and drive pulley. One outstanding feature is that when it is expanded to a 14 cu. ft. job, it is still operated at the relatively low speed of 740 r.p.m.

## Wheel Service

### Equipment Moves

As a result of increased business Wheel Service Equipment Corp., manufacturers of wheel repair equipment, have moved to a larger building at 407-409 East Fort Street, Detroit, Mich. Increased facilities for better service to the customers are secured at the new location.



Chevrolet engineers make sure what they are talking about when they prefer one type of combustion chamber to another. Roy Conely is cutting spherical sections from a plaster cast of a model combustion chamber in order to measure the rate and direction of flame travel within the chamber.

## Strong Promotion Campaign For Super Pyro Anti-Freeze

Six million automobile users in 1937 is the goal at which the U. S. Industrial Alcohol Co. is aiming with release of its latest advertising program for its SUPER PYRO anti-freeze.

According to Leslie S. Gillette, Advertising Manager, this coming winter marks the fifth season for Super Pyro. When first introduced in 1933, Super Pyro was sold to 800,000 motorists. With increasing expenditures for advertising and promotion in succeeding years, this number jumped to 4,600,000 in 1936, making a total of 11,000,000 users in four years.

The current program includes increased expenditures for consumer advertising in six leading national magazines and an enlarged two months' billboard schedule.

## Pikes Peak Climb

Famous Pikes Peak, at Colorado Springs, Colo., was being prepared for the annual running of the historic Climb Labor Day, September 6, as MOTOR AGE went to press.

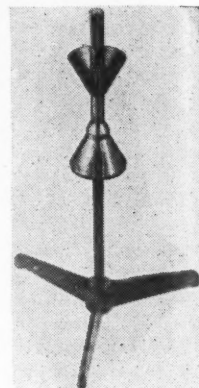
Leading drivers, veterans of the climb which had been run annually—except for 1935—since 1916, were ready to bid for prizes amounting to \$2,225 for the race against the second hand up 12 miles and 2,200 feet.

The Climb again was under sponsorship of the Veterans of Foreign Wars Post No. 101, of Colorado Springs, who revived the climb last year after a layoff in 1935 because of controversy over the contract for the highway.

For the first time in the peak climb's history, the drivers were required to use standard gasoline to be found at the corner service station pump.

## Low Priced Horizontal Wheel Balancer

A horizontal wheel balancer employing a new method of balancing has been announced by Van's Auto Specialty Co., of Clyde, Ohio. A spirit level is incorporated in the end of the vertical shaft on which the wheel is mounted, and balance weights are added to the rim of the wheel in the conventional manner, centering the spirit bubble in the end of the shaft. This new balancer permits a quick, accurate job, and its low price will appeal to all. Net price \$18.00.



## Offer to Amateurs

### Withdrawn by Ford

The offer of \$10 each for satisfactory truck pictures recently extended to amateur photographers by Ford Motor Company has been withdrawn, it is announced.

Approximately three hundred pictures were submitted by photographers in all parts of the country. Of these, twenty-nine have been accepted and paid for and the remainder are being returned to the senders.

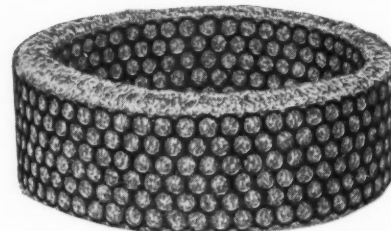
Those being returned were rejected for various reasons. Some were not of current truck models, others lacked interest or failed to tell an interesting story, while many were unfit for reproduction.

The Ford Motor Company appreciates the interest shown in the offer and thanks all those who participated.

## AC Air Cleaner

### Has Removable Filter

The new air cleaner introduced by the A. C. Spark Plug Co., Flint, Mich., has been completely redesigned so that the filtering element is easily removed, and may be discarded and a new one inserted at a cost practically the same as for servicing the previous



type of air cleaner. The filtering elements used for replacement purposes are pre-oiled, enclosed in an oil-proof wrapper, and attractively packaged. The air cleaner used on a particular car is calibrated with the carburetor setting on that car, and the original equipment filtering element should be used for replacement.



# GENUINE BENDIX DRIVE SPRINGS



## ARE NOW PACKAGED IN INDIVIDUAL CARTONS for your protection and convenience!

**H**ERE'S news! Good news! It's a new merchandising program that makes selling *genuine Bendix Drive Springs* even easier than ever before.

Now, every *genuine Bendix Drive Spring* will be *individually* packaged in an attractive blue and white carton. Formerly they have been packaged five Springs to the box.

You recognize, of course, the many advantages. *First*, you are now able to deliver each Spring to your customer in an

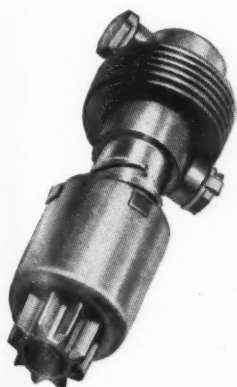
identifying package with the part number plainly printed thereon. *Second*, each carton now contains a thorough description of the Spring. *Third*, each carton will carry an abridged equipment list showing the cars and trucks using this famous Spring. *Fourth*, it gives additional proof that you sell the *genuine Bendix Drive Spring*.

All these things mean easier sales . . . and bigger sales . . . on this Spring *whose quality is the standard of the industry*.

**ECLIPSE MACHINE COMPANY**

(Subsidiary of Bendix Aviation Corporation)

ELMIRA, N. Y.



## Willys Has Patent on Body Design

The body design of the new Willys, which has been termed by many motor car body designers as an advanced conception of the modern type of body design, is covered by a design patent, according to David R. Wilson, president of Willys-Overland Motors, Inc., Toledo, Ohio.

The design patent protects the manufacturers against infringement on the general contour of the distinctive type hood, the type of design used in the body which permits unusual room in the interior of the car and on the general lines of the completely assembled body units.

## Stromberg Has New Motor Analyzer

Motoscope "500" is a new motor analyzer introduced by the Stromberg Motoscope Corp., 2709 Belmont Avenue, Chicago, Ill. Beautifully finished, and equipped with the latest and most accurate instruments, this piece of



equipment makes possible over 50 tests of engine operation. In addition to the regular electrical tests, the Motoscope "500" will test fuel pumps, vacuum and compression, exhaust gas analysis, and windshield wiper operation. For complete information and prices, write the manufacturer.

## Studebaker Appoints 56 New Dealers

South Bend, Ind.—Fifty-six Studebaker dealers were appointed during the month of July, bringing appointments for the year to date to 617, according to George D. Keller, vice president in charge of sales of The Studebaker Corporation.



## A. R. Boscow Joins Nash

KENOSHA, WIS.—A. R. Boscow, widely known throughout the automotive industry as an advertising and sales executive, has been appointed to fill the newly created post of director of advertising and merchandising of the Nash Motors Division of Nash-Kelvinator Corporation, it was announced by C. H. Bliss, vice-president and director of sales.

Creation of the new position and appointment of Mr. Boscow to fill it are in line with Nash Motors' program of expansion, which is being carried on not only in the company's plants at Kenosha, Racine and Milwaukee, Wis., but also in the distributor-dealer organization in the field, said Mr. Bliss. Mr. Boscow, he pointed out, will work closely with distributors and dealers in building advertising and merchandising programs to fit their own particular needs.

## New Members for N. S. P. A.

The N.S.P.A. roster shot through the 600 mark, bringing the membership to the highest point in the Association's history, as a result of the election of sixteen new members by the Board of Directors in Detroit, July 23d. Of the sixteen new firms awarded the emblem, nine are wholesalers, and seven manufacturers.

The list of new manufacturer members elected, together with the names of the executives who will represent their companies in Association affairs follows:

Chicago Pneumatic Tool Company, New York City, P. T. Harris; The Electric Heat Control Company, Cleveland, Ohio, W. J. Bartlett; G. A. C. Manufacturing Company, Ashland, Ohio, Guy A. Countryman; Pratt Industries, Inc., Frankfort, New York, G. H. Sicard; Sight Feed Generator Company, West Alexandria, Ohio, C. F. Smith; The Torrington Company, Torrington, Connecticut, F. T. Case; Turnsignal Corporation, Philadelphia, Pa., H. O. Smith.

## Parts, Equipment and Maintenance Exposition

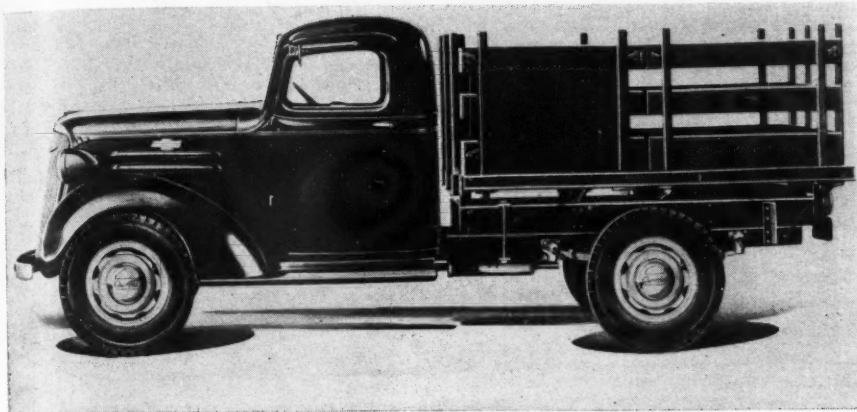
The 1937 Auto Parts-Equipment and Maintenance Exposition will be held at the 212th Coast Artillery Armory, 62nd Street and Columbus Avenue, New York City, October 26th to the 29th inclusive, is sponsored by the Automotive Wholesalers, Inc., with the active co-operation of the Automotive Boosters Club, No. 13, Inc. It will be the largest educational project of this type ever conducted in New York City.

The Exposition is managed by E. A. Toven, who has had many years of experience in the handling of shows, and who was formerly manager of the Grand Central Palace in New York City. Offices have been opened at the Hotel Empire, Broadway at 63rd Street, New York City.



**Breaking the Bank** The gambler's term as applied to auto racing. This Bugatti crashed through the fence during the Coronation Trophy races at the newly opened Crystal Palace Road circuit, London, Eng.





New Chevrolet  $\frac{3}{4}$  and 1 ton trucks are offered on a 122 inch wheelbase with the standard Chevrolet Truck engine of 78 B.H.P.

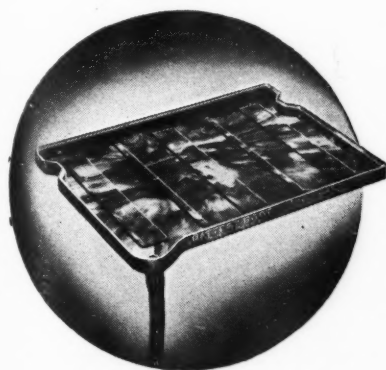
### Chevrolet Adds Two Trucks

Between its half-ton and  $1\frac{1}{2}$ -ton trucks Chevrolet has inserted a  $\frac{3}{4}$ -ton and one-ton model, having gross vehicle weights of 5200 and 5800 lb. Each has a standard wheelbase of 122  $\frac{1}{4}$  in. Front and rear tread of the one-ton model are narrower to assist maneuverability of the larger unit.

Engine in the new models is the Chevrolet standard 78 b.h.p. truck design. The clutch on both models is said to be identical with that used in  $1\frac{1}{2}$ -ton models, and the transmission from the half-ton model, standard on the new jobs, can be optioned by the four-speed transmission used in the  $1\frac{1}{2}$ -ton model. Single-acting shock absorbers are included in the rear suspension of the  $\frac{3}{4}$ -ton model. Only single rear wheel equipment is available on both new models. Prices are:  $\frac{3}{4}$ -ton chassis, \$430; one-ton chassis, \$465.

### Battery Boot for Ford Cars

A new rubber battery boot for installation beneath the storage battery of the 1937 Ford V-8 passenger cars, and trucks with dash mountings, has been developed by Carlile & Doughty, Conshohocken, Pa. Its purpose is to



drain off corrosive acids to the ground harmlessly and thus prevent corrosion of such vital mechanisms as the starter, spark plugs, engine head, wiring, chassis, etc. The battery boot is made of durable rubber, and not only serves as a drain for acids but also acts as a cushion in absorbing vibration and shock.

### New Packages For

#### Pedrick Rings

Piston rings manufactured by the Wilkening Mfg. Co., 2000 South 71st St., Philadelphia, Pa., are now packaged in a new series of boxes which feature a patented locking device so that the jobber and the dealer will know that the package has not been



tampered with. The exclusive feature of this device is that it seals the package, yet does not destroy the usefulness of the package nor mar its appearance after the seal is broken. Pedrick Hydraulic rings now are packaged in boxes of rich red-and-gold combination.

## General Motors

### July Car Sales

Sales of General Motors cars to consumers in the United States totaled 163,818 in July compared with 163,459 in July a year ago. Sales in June were 153,866. Sales for the first seven months of 1937 totaled 1,035,044 compared with 1,127,910 for the same seven months of 1936.

### More Parts Installed

Reports received for June from manufacturers furnishing their monthly business indices to the Motor and Equipment Manufacturers Assn., indicate that while service parts shipments to wholesalers made a satisfactory gain over May business, decreases in other branches of the industry brought the Grand Index down several points.

The Grand Index for all branches of the industry in June declined to 174% of the January 1925 index as compared with 181% for May and 157% for June last year.

CURRENT MONTHLY INDEX (See Page 2 For Past 4 Years By Months) (January, 1925 equals 100)				
	June 1937	May 1937	June 1936	June 1935
Equipment Shipped to Car Mfrs.	190	202	166	
Parts Shipped to Jobbers	167	152	151	
Accessories Shipped to Jobbers	99	103	112	
Service Equip. Shipped to Jobbers	154	157	115	
GRAND INDEX of above divisions	174	181	157	
Index Car and Truck Production	217	225	196	
Index General Business	79	78	79	

SALES TO CONSUMERS IN UNITED STATES				
	1937	1936	1935	1934
January	92,998	102,034	54,105	23,438
February	51,600	96,134	77,297	58,911
March	196,095	181,782	126,691	98,174
April	198,146	200,117	143,909	108,349
May	178,521	194,828	109,051	95,253
June	153,866	189,766	137,782	112,847
July	163,818	163,459	108,645	101,243
Total 7 Mos.	1,035,044	1,127,910	757,480	596,215
August		133,804	127,346	86,288
September		85,201	66,547	71,648
October		44,274	68,566	69,090
November		155,552	136,859	62,752
December		173,472	122,198	41,530
Total		1,720,213	1,278,996	927,493

# GOOFY GADGETS

## Featuring The ACCIDENT AVOIDER

by JOHN HENRY

YE OLDE WAY

The NEW WAY

These PIPES ARE EXTENDED by HYDRAULIC PRESSURE

## Shoemaker Line to Be Sold by Circo

Announcement is just made to the trade that the Shoemaker line boring and connecting rod and rebabbiting equipment will be sold exclusively through Circo Products Company, 3088 W. 106th St., Cleveland, Ohio.

Making up the complete line of Shoemaker equipment are these items: Double and single Spindle Con-Rod machines for boring rods up to 4 in. in diameter.

Electrically heated casting jig and mandrels for pouring rods up to 4 in. in diameter.

Align boring machines for Fords

and Fordson, Chevrolet, Plymouth, and also one for all large motors. Casting jigs for pouring bearings in both caps and blocks for all Fords and Fordson.

Kriss Kross Oil Groover for cutting oil grooves in Con-Rods.

Single and Three Pot Gas Furnaces for Babbitt metal.

Gas Torches for preheating blocks.

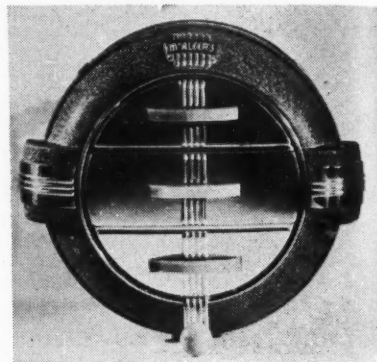
Thermometer for Testing temperature of Babbitt metal.

### Guaranteed Parts Catalog

Guaranteed Parts Co., Inc., 248 West 54th St., New York City, has ready for circulation their new 1937 catalog showing complete information up to and including 1937 passenger car, trucks and buses.

## Heaters for 1937-38

The McAleer Mfg Co., 2431-39 Scotten Ave., Detroit, Mich., has announced their complete line of car heaters for the 1937-38 season. Illustration is of the DeLuxe Model, listing at \$22.95. Additional models are also supplied, ranging in price



from \$12.95 to \$18.95, with a special Ford package at \$16.95. All models have defroster ports, and adjustable doors on a revolving front. Four distinct color combinations. Counter and window displays, selling helps, and a specially constructed carrying case for salesman's sample are also available.

### Aids Valve Stem Replacement

For any job of valve stem replacement requiring an angle bent stem, the new Dillectric Hand Bendable Stem provides a complete valve stem unit that can be easily bent by hand to any angle desired. A soft metal tube insert within the rubber stem makes this possible. This feature eliminates the past necessity for stocking various styles of ready bent valves and enables tube repairmen to handle all demands quickly. The new Hand Bendable Stem is designed for use with any Dillectric tube repair clamp and is available in boxes of 10 with electric vulcanizing unit at \$3.69



per box. Complete information may be obtained from The Dill Mfg. Co., 700 East 82nd St., Cleveland, Ohio.

### New Equipment Guide

Gives best set-ups for handling service jobs on the modern back-geared screw-cutting lathe and shows necessary attachments and tool assortments. 16 pages—index tabs. Write Atlas Press Company, 1819 North Pitcher St., Kalamazoo, Mich.—ask for Bulletin 478—no obligation.



## ... Got Your Lesson? ...



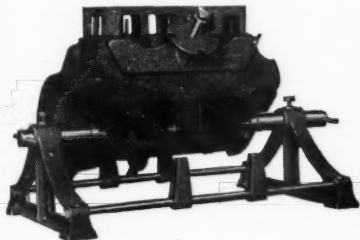
You may think you're a careful driver—and maybe you really are—but, brother, September brings back the school kids and that means *watch your step!* Brakes that were good enough all summer aren't good enough now. You better get 'em fixed. You better get 'em relined with AMCO lining, brother!

**ASBESTOS MANUFACTURING CO., Huntington, Ind.**



## Motor Cradle Holds Ford V-8 Blocks

The Automotive Maintenance Machinery Co., 2100 Commonwealth Avenue, North Chicago, Ill., has developed a motor cradle for holding a Ford V-8 motor block while re boring or honing the cylinders. The cradle holds the block so that the cylinder bores on one side of the block are in a vertical



position. The block is suspended in such a manner that after the bores on one side have been resized, the block can be tilted so that the opposite half of the block will then have bores in vertical position. Cylinder head studs are always in the clear and in no danger of being damaged.

## LaFayette Adopts Auto-Lite Plugs

Nash, which produced over 41,000 cars during the first six months of 1937 has adopted Auto-Lite spark plugs as standard equipment on LaFayette cars, according to an announcement received from the Electric Auto-Lite Corp., Toledo, Ohio. This is the third car manufacturer to adopt Auto-Lite spark plugs during the current year.

## K-D Issues Valve Service Bulletin

Ford V-8 and Lincoln-Zephyr valve servicing is the subject of a new service bulletin published by the K-D Mfg. Co., 510 Plum Street, Lancaster, Pa. The bulletin is in book form, and is full of specific instructions, clear-



ance data, adjustment information, tune-up charts and helpful suggestions. Copy will be sent free to shop owners or service managers when requested on your business letterhead.

## Thousandth-of-a-Second Timing For Racing

The eye is quicker than the hand. Modern automobile and motorcycle racing is benefiting from this reversal of the old maxim of the magician.

The eye—in this instance—is the electric eye, or photoelectric tube, the same device which has made a definite place for itself in recent seasons by detecting the winner of a horse race and causing a high-speed camera to photograph the finish for the records. Now the electric eye has been incorporated in an electric timing device by H. J. Miller, an engineer of the General Electric Company, with the

result that the speeds of racing automobiles, motorcycles, bobsleds, and other competitive vehicles can be timed to the thousandths of a second.

The equipment employed includes a G-E electric eye and satisfactory light sources, mounted on a tripod at the edge of the track. Two eyes and two light sources are used where the starting and finishing lines are in two different places. When the light source is interrupted, an impulse is generated by the electric eye, starting the timing device. On a closed racing circuit, where start and finish lines are the same, only one light source and electric eye are used, the single impulse starting or stopping the timer as desired.

# SWEET MUSIC

Join the profit parade. Every new car built today has one or more Weatherhead parts. So—when you replace with Weatherhead your job is easier... quicker—no excuses of "just as good as..."

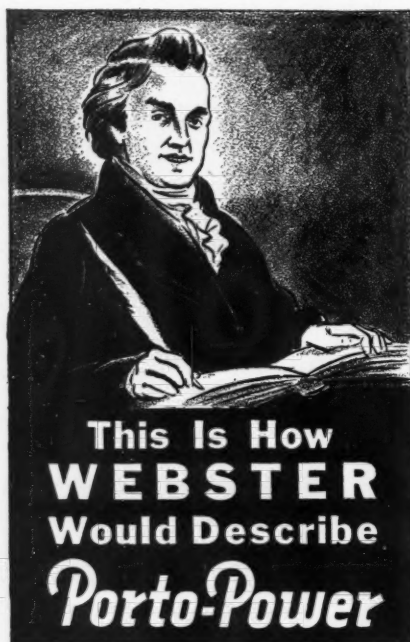
With Weatherhead you give customer satisfaction... get a busier shop... and sweeter music in the cash register.

THE WEATHERHEAD CO. • CLEVELAND, OHIO

Ask your jobber for

# WEATHERHEAD

FITTINGS • ARMATURES • HYDROMETERS • FUEL LINES • BRAKE HOSE

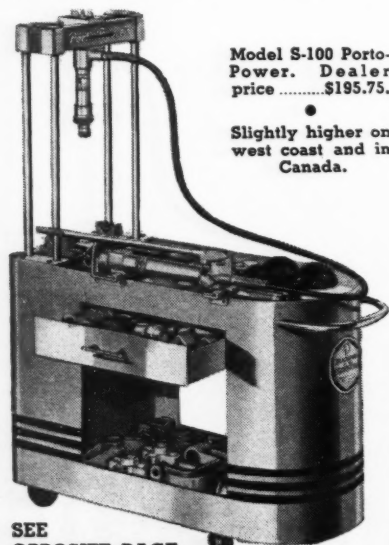


**Porto-Power** (Por'to-Pow'er) — the combination of a 7-ton remotely controlled hydraulic ram, hose, and pump; a wheeled stand, on which is mounted a press; plus special attachments, chains and extensions. Furnishes tremendous hydraulic power for body rebuilding, frame and axle straightening and general shop jobs. Hydraulic power, developed by hand-operated pump is transmitted to ram by six-foot flexible, high pressure hose. Pump mounts on stand or is removable for work in car interiors. Ram mounts in press or is used remotely in any direction on bodies, frames or other work pieces.

Attachments, chains and extensions adapt power of ram to pulling, pushing, bending, pressing, clamping, straightening and lifting.

**THAT'S THE DICTIONARY DEFINITION** — Now ask your jobber salesman for the **DEMONSTRATION!**

**BLACKHAWK MFG. CO.**  
Dept. MA-9 Milwaukee, Wisconsin



Model S-100 Porto-Power. Dealer price .....\$195.75.

Slightly higher on west coast and in Canada.

SEE  
OPPOSITE PAGE

**BLACKHAWK**

## Buick Rear Axle Service

(Continued from page 21)

With the latter method, the gear teeth are given a light coat of the lead and the gears are run slowly with the engine in first speed and then reverse. Also the brakes are applied. By examining the contact marks on the gear teeth it can be determined whether the pinion should be moved forward or backward or whether the ring gear should be moved to right or left. Details of this test are given in one of the illustrations.

The other method of pinion and ring gear adjustment is to utilize a special gage. A definite setting for pinion depth is determined in manufacture by testing each set of gears. These settings are marked on the toe end of each pinion and read plus or minus a nominal amount in thousands of an inch.

A plus marking indicates that the pinion is to be set away from the center line of the axle. That is, toward the front of the car. A minus marking indicates that the pinion is to be moved toward the center line of the axle. The method of mounting this gage on the 1937 Buick rear axles is illustrated.

The setting gage carries a table with the nominal dimension for the various cars. The nominal dimension figure shown is the amount the micrometer pointer is moved from the zero mark for each different model pinion depth.

To locate pinion adjust micrometer the amount shown on the table. This is the nominal setting for the pinion. Next, move the micrometer pointer the amount given on the end of the pinion gear. If a plus mark is shown, adjust the pinion in or away from the center line of the rear axle. If a minus mark is shown, adjust the pointer out or toward the center line of the axle.

The next step is to place the gage in the differential carrier pedestals and with pointer against the end of the pinion, move the pinion in or out by means of shims until the pinion is at the nominal depth plus or minus the amount marked on the pinion.

On all 1937 Buick cars, the pinion depth is controlled by means of shims placed between the outer row of the double row ball bearing and a shoulder on the housing. Adding shims moves the pinion toward the center of the axle.

The Buick factory instructions for the adjustment of differential side bearings is as follows:

- 1—Remove adjusting nut locks.
- 2—Back off right bearing cap screws one and one-half turns and tap cap lightly with hammer to free bearing race and adjustment nut.
- 3—Mark position of both adjusting nuts.
- 4—Watch outer race of right bearing turn with adjusting nut, as nut is slowly backed off and stop when race stops turning. Mark this new position of the adjusting nut and return to original position. Repeat, backing off adjusting nut and again stop when bearing race stops turning with nut. This should be same as before and the number of notches

between original position and "free" position of the nut are the "notches tight" of the bearing.

**CORRECT ADJUSTMENT IS NOT LESS THAN 1 NOR MORE THAN 1½ NOTCHES TIGHT.**

5—If the bearing race did not turn when backing off the adjusting nut, the bearings have "lapped" free, or one of the bearings has "locked" and turned on the hub of differential case. Before investigating further, determine how loose the bearing was by drawing up the adjusting nut until outer race just starts to turn with the nut.

6—Equalize the adjustment between right and left bearings, that is, if race started to turn with first movement of nut "in" but did not turn when backing "out" the nut, tighten right nut one notch and tighten left nut one notch, total two notches tight.

7—Draw down cap screws lightly and tap both caps with hammer to permit seating of bearings, then tighten down cap screws.

**NOTE:** When differential side bearing adjustment is found to be less than one notch tight, investigate the cause. Look for side bearing loose on hub of differential case or ball bearing failure.

**RING GEAR BACKLASH ADJUSTMENT:**

1—Thoroughly wash all oil from gear teeth of gear and pinion with clean gasoline.

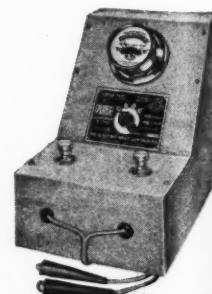
2—Inspect adjustment of differential side bearing as instructed above.

3—Clamp dial indicator which is graduated in .001 in. to axle housing rim so that indicator button bears against the working surface or a ring gear tooth near the outer edge of the gear and to indicate movement in the direction that the gear rotates.

4—Lightly rock the gear back and forth to take up all clearance between teeth of gear and pinion, using care that the indicator is so adjusted to give accurate reading. This is the direct reading of **BACKLASH AND SHOULD NOT BE LESS THAN .006 in. NOR MORE THAN .010 in. FOR NEW GEARS**, with slight increase over .010 in for gears which are worn.

## "King" Announces New Condenser Tester

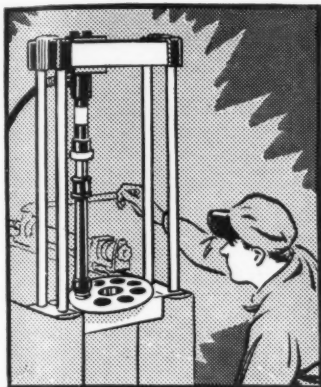
The Electric Heat Control Co., 9123 Inman Ave., Cleveland, Ohio, announces a new type condenser tester. Known as Model K-9, the new tester will detect series resistance as small as ½ ohm, it is claimed. This tester operates on an entirely new principle.



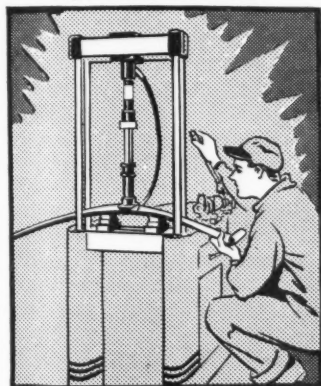
unusually sensitive



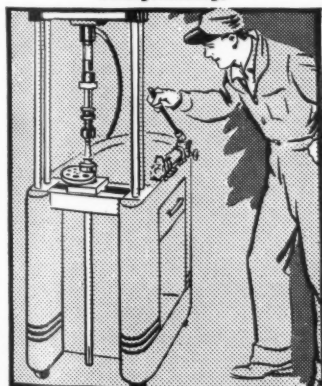
# HERE'S HOW PORTO-POWER HANDLES...



Note ram off center for work on clutch housings, brake drums, etc.



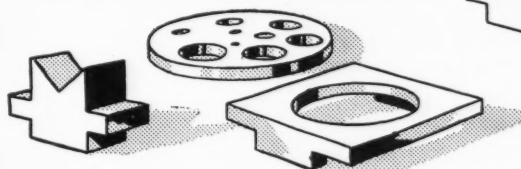
Bent bumpers slip between side rods for straightening.



Recess in end of stand increases pressing range to almost 4 feet.

## PRESSING BUSINESS

**YOU** get more than a hydraulic jack when you buy the S-100 Porto-Power. TRUE—the 7-ton remotely controlled Porto-Ram and attachments pull, push, twist and do any darn thing right on the auto body, frame and axle. BUT, there is a BIG PRESS mounted on one end of the Porto-Power stand — and Porto-Ram does more tricks than a gorilla when locked in that press! It pops out bushings, bearings, gears — re-arches springs and is even handier than ordinary single-unit hydraulic shop presses.



### PORTO PRESS Attachments

Two "V" blocks; a 9-hole adaptor, for various size bushings; and a convenient press plate — are included with the S-100 Porto-Power. They help adapt the tremendous, micro-precision power of Porto-Ram to hundreds of pressing jobs.

Porto-Power's ability to handle pressing business makes this machine a PRESSING NEED in your shop! Write for FREE literature. Better yet — order an S-100.



See opposite page for full description of entire S-100 Porto-Power.

### Exclusive features of the PORTO PRESS

This four-column press is made of cold rolled steel. Sides and bottom are open to handle large and odd-size work-pieces. Ram slides to any point for off-center jobs. Width across press bed, 15"; height between cross members, 26"; clearance between ram and bed, 15".  $3\frac{1}{2}$ " between side rods. Safety margin—50% overload.

BLACKHAWK MFG. COMPANY, Dept. MA-9, Milwaukee Wisconsin

Exclusive Canadian Distributor:

THE CANADIAN FAIRBANKS-MORSE CO., Limited  
Branches in all Principal Cities



See opposite page

# BLACKHAWK Porto-Power

### Manifold Stud Nut Wrench

A special wrench for removing or replacing manifold stud nuts on the late model Chrysler and Dodge cars has been announced by Bonney Forge and Tool Works, Tilghman & Meadow Sts., Allentown, Pa. It is drop-forged of chrome-vanadium steel, chromium

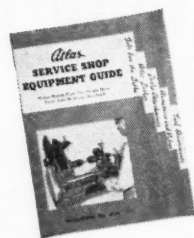


plated, with the heads buffed to a high permanent lustre. Has  $\frac{1}{8}$  in. and  $\frac{5}{8}$  in. double hexagon openings and is 9 in. overall. Catalog No. 2883.

### Newman Heads Goodrich Tire Division

James J. Newman, for the past four years a vice-president of The B. F. Goodrich Co., has been named vice-president and general manager of the company's tire division, it has been announced by President S. B. Robertson. The post of tire division head was held by Mr. Robertson from September, 1931, until February, 1937, when he was elected executive vice-president. Mr. Newman joined the Goodrich organization in 1931 as assistant to the president and was elected vice-president in 1933.

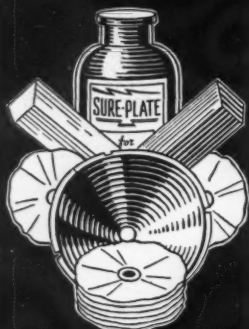
### Equipment Guide by Atlas



The new Atlas Service Shop Equipment Guide has just been released by Atlas Press Co., 1819 North Pitcher Street, Kalamazoo, Mich. It gives the best set-ups for handling service jobs on the modern back-geared screw-cutting lathe and shows the necessary attachments and tool assortments. Write for your copy of Bulletin 47S—no obligation.

# SURE-PLATE

A New Low Cost Method of  
Resilvering Reflectors



This handy Sure-Plate Kit, complete in every detail, puts mechanics, super-service stations and dealers in the profitable, fast-growing resilvering business.



Large canvas sign supplied free with each Kit—a vivid display which commands car owner attention.

## Money-Making Labor-Saving SURE-WELD

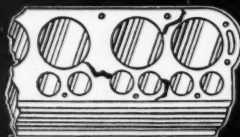
A money-making, labor-saving method of permanently sealing cracks in cast iron and aluminum cylinder blocks and heads. For valve port cracks, water jackets and cylinder walls, Sure-Weld is unconditionally guaranteed to do its job. There is a year-round market and a constant turn-over in this tried and tested liquid weld. Liquid Weld, Pint Size, \$2.00. List, \$1.40 to the Trade.

### Shining Dollars for You from SURE-PLATE

For headlight work Sure-Plate offers the additional profit which comes with resilvering reflectors. Millions of car owners need this service and Sure-Plate gives the mechanic the opportunity to get this valuable business. The one-hundred reflector Kit is only \$12.50 to the Trade.

Complete catalog information and detail will be supplied on request. Write today for this profitable information.

**SURE-RITE PRODUCTS CORPORATION**  
6010 N. Camac Street PHILADELPHIA, PA.  
Warehouse at 1910 Grand Ave., Kansas City, Mo.



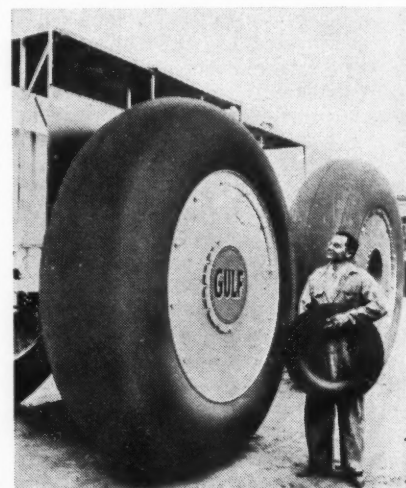
For outside or inside block cracks Sure-Weld makes a permanent seal in one hour. Unconditionally guaranteed.

# SURE-WELD

A Guaranteed Liquid Solder for Valve  
Ports, Water Jackets and Cylinder Blocks

### Gulf Swamp Invader

The Gulf Marsh Buggy, probably the most unique, yet practical vehicle ever devised by man, was put through a series of rigid tests today prior to being shipped to Gulf field crews in the south. The huge vehicle, which combines the basic principles of motor car, tractor, and boat, enables men searching for oil bearing strata to carry their heavy equipment into swamplands which heretofore have been practically impenetrable.



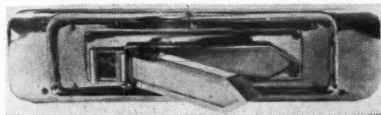
The giant machine which rolls over both land and water with almost effortless ease is the second of its kind to have been constructed by Gulf within the past year. Without doubt, the size of the Gulf Marsh Buggy's tires—120 x 33.50—is the thing that remains longest in the minds of those who have seen the strange vehicle. In order to produce the tires, which, incidentally are the largest ever fabricated for commercial use, it was necessary to construct special molds. The tires weigh approximately 350 pounds each and are inflated to a pressure of but six pounds per square inch.

On solid land, the 4,000 pound vehicle has a speed of slightly more than 20 miles per hour. In waist deep mire and water, its speed is 12 and 6 miles per hour respectively. Credit for the construction and successful operation of the buggy is attributed to Gulf engineers A. A. Lane, R. J. S. Pigott, and E. W. Jacobson.

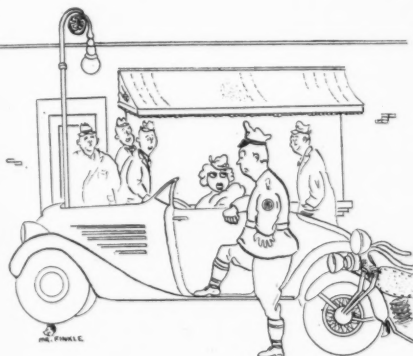


## Semaphore Signals For Truck Operation

Warning signals on the rear of a truck or semi-trailer that are positive in action and clearly visible to approaching drivers have been announced by the Beacon Corp., Minneapolis, Minn. The signal consists of a semaphore, which, when not in use, fits flush with the side of the body. When in operation, the semaphore swings out into position and flashes a red light. Operation is by



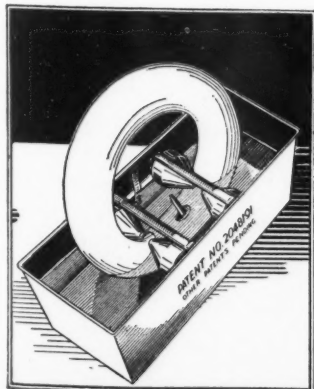
means of a control box within easy reach of the driver. The signal unit consists of opening and closing solenoids, the dash pot for moving the semaphore, the electro-magnetic bar and the reduction resistance coil. For complete information write the manufacturer.



"Oh officer, let's go somewhere where we can talk!"

## Test Tank For Locating Leaks

A new test tank for locating leaks in tire tubes has been developed by the Fair Oaks Co., 724 Burlington Avenue, La Grange, Ill. Special brackets keep the tube upright in the tank and an electric light under the water helps to locate the leak. Tank size 40 in. x 12 in. x 13 in. deep.



## Whiz Announces New Brake Fluid

The R. M. Hollingshead Corp., Camden, N. J., makers of WHIZ products, has announced the addition of the new Whiz No. 3 Hydraulic Brake Fluid to their line. The new fluid is said to contain no alcohol or other evaporating or vaporizing agent, and insures braking efficiency from 250 deg. above to 50 deg. below zero, and will not corrode metal or rot rubber. Furnished in pint, quart, gallon and 5-gallon sizes.

## Gasoline Consumption Up

California this year once more leads the country in gasoline consumption, according to figures in the American Petroleum Institute bulletin. For five months through May the consumption was 697,323,000 gals. against 652,660,000 gals. for the like period of 1936. New York was in second place, using 672,019,000 gals. against 603,429,000 gals. last year. For the country as a whole, the total consumption for five months was 7,932,636,000 gals., a gain of 12.05 per cent over 1936.

**TURN *Testing* into QUICK PROFITS with a NIEHOFF *Certified* "COILOMETER"**

**ANALYZES COILS UNDER ALL CONDITIONS Try THIS ON YOUR NEXT CUSTOMER AND WATCH SALES Boom! on COILS CONDENSERS - POINTS CAPS - PLUGS - ROTORS**

**M**AKES testing of any coil rapid and easy. Faulty condensers, incorrect plugs, leaky ignition cables, cracked caps and rotor troubles are quickly detected. Car owners can see at a glance what is wrong and will suggest new replacement parts. A super silent salesman—always on duty—whose streamlined two-tone anodized aluminum panel sparkles with inviting sales appeal. It is Certified and precision made—the Finest Equipment on the Market—to help you sell replacement parts and service, create a faster turnover and ring up extra profits. Remember that it operates from car battery or any six volt battery. Can be hung on radiator tie rod in full vision of customer. Ask your Jobber for this new precision Testing Equipment TODAY! If he can't supply you write, wire, or phone and we'll gladly mail you our new Catalog in colors with latest price list.

## READ THESE FEATURES THAT PRODUCE SALES

- ★ Tests coils on or off the car. Three speeds show coil performance under all conditions.
- ★ Accurately indicates dead short draw of coil and draw at operating speeds. Pre-heats coils if desired.
- ★ Geissler tube quickly detects coil missing at high speed.
- ★ Coil output is indicated in millimeters on large meter dial which records adjustable spark gap.
- ★ Tests condensers on or off the car and shows action of condenser under test on coil output and breaker points.
- ★ Tests cables, spark plugs, caps and rotors while motor is running.

Genuine  
**NIEHOFF**  
PRODUCTS

**C. E. NIEHOFF & CO.**  
230 W. SUPERIOR ST. - CHICAGO, ILLINOIS

★ **ENGINEERED** FOR ACCURATE PERFORMANCE AND DEPENDABILITY ★





# Edison

leads the industry  
in engineering  
improvements



A Plug... and a proposition  
made-to-order for every independent  
dealer

Only  
**EDISON** has this  
100% gas-tight seal

Every spark plug engineer for years has labored to overcome compression losses due to leaky, ill-fitting gaskets. Edison offers you this exclusive, patented spark plug with the gasket **built-in** so that a concentric fit is assured. This type will out-perform and out-live any other spark plug, and it is much easier to install as well.

Edison leads the spark plug industry in engineering improvements—with the new Built-in, Leak-proof Gasket that provides a 100% compression tight spark plug. Edison also leads in protecting its retail outlets from chain store, mail order and other forms of cut-price competition. Edison costs **less**, yet **sells for the same price** as other

first line spark plugs. And, Edison is the line that is building prestige and profit for every forward-looking dealer through consistent national advertising and intelligently planned merchandising helps. Ask your jobber for evidence of all these claims. When you see the proof, there can be only one answer.

EDISON-SPLITDORF CORPORATION • West Orange, N. J.

ONE OF THE  
*Thomas A. Edison*  
INDUSTRIES

## SOMETHING TO Crow ABOUT

You can do a lot of service jobs with this Walker Hydraulic Bumper Jack—and it's an easy number to sell car owners.



Walker Hydraulic Bench Jacks have plenty of power—7 to 20 tons of it. They handle tough bending or straightening jobs easily.

● It's the extra value features—the unexcelled performance and right prices of Walker Hydraulic Jacks that mechanics like so well. Users praise the smooth action, built-in strength and dependable hydraulic power. Walker Hydraulic Jacks give you maximum ease, speed and dependability for lifting cars, trucks or buses and for heavy-duty shop or bench jobs. Models in capacities from 1½ to 20 tons featuring automatic safety valve, removable oil filter screen, center pump and handle socket and many other exclusive advantages. See the display at your jobber's.

WALKER MFG. COMPANY, Racine, Wis.  
Makers of Walker Electric Lifts & Exhaust Silencers

# WALKER

Hydraulic Jacks

## Current Control Service

(Continued from page 25)

two screws on the back side of relay and move armature up or down as required.

**POINT OPENING**—Measure the contact point opening with the armature in the up position. On the models having the auxiliary set of contact points as illustrated in Fig. 1, (Fig. 5 for Current and Voltage Regulator) adjust the point opening by bending the ground contact support that carries the upper auxiliary contact. The point opening on the other models is adjusted by means of the conventional armature stop. Clean contact points by filing slightly with a thin, fine-cut file. The contact file should not be allowed to become greasy and should not be used to file other metals. NEVER USE SANDPAPER OR EMERY CLOTH TO CLEAN CONTACT POINTS. Use the file lightly as the contact metal is only a few thousandths thick.

**CLOSING VOLTAGE**—Adjust the closing voltage by bending the spring post to increase or decrease the tension of the armature spring. Increasing the spring tension increases the closing voltage and decreasing the tension will decrease the closing voltage.

### Voltage Regulator Unit Adjustments

(For Voltage Regulators See Figure 1.  
For Current and Voltage Regulators See Figure 5.)

**VOLTAGE SETTING**—Bend the lower spiral spring hanger slightly to adjust the voltage setting. Bending it down to increase the armature spring tension increases the voltage setting and decreasing the spring tension decreases the voltage setting. Always decrease generator speed until cut-out relay contact points open and then increase speed to 2000-3000 r.p.m. and readjust resistance to maintain the 8-10 amperes output before taking a final reading. COVER MUST BE IN PLACE WHEN TAKING VOLTAGE READING. If the voltage setting cannot be adjusted by slight changes in the spring tension, clean the contact points. If, after cleaning the contact points, it is still impossible to obtain the correct voltage setting by small changes of the spring tension, it will be necessary to proceed with the following adjustments.

**AIR GAP**—With the fiber bumper barely touching the contact spring post, check the air gap between armature and center of core. Adjust the air gap by bending the contact spring post.

**POINT OPENING**—With the armature held down against the lower armature stop, measure the contact point opening. Vary the point opening by adjusting the lower armature stop.

**GAP BETWEEN FIBER BUMPER AND CONTACT SPRING POST**—When the armature is up, check the gap between the fiber bumper and its stop. Adjust the upper armature stop to obtain the correct gap.

**CONTACT POINT SPRING TENSION**—Contacts should be adjusted to meet squarely and with a minimum pressure of 3½ ounces. (Check pressure at the instant the points separate, using a spring scale of the type for checking distributor lever arm tension.) Adjust pressure by slightly bending the contact spring carrying the upper contact.

**VOLTAGE SETTING**—It should now be possible to bend the lower spring hanger, increasing or decreasing the armature spring tension and obtain the correct voltage setting. Always decrease generator speed until cut-out relay contact points open and then increase speed to 2000-3000 r.p.m. and readjust resistance to maintain 8-10 amperes output before taking a final reading. COVER MUST BE IN PLACE WHEN TAKING VOLTAGE READING.

DO NOT RUN GENERATOR OR SET VOLTAGE ON OPEN CIRCUIT. THIS WILL CAUSE DAMAGE TO THE REGULATOR.

### Delco-Remy Vibrating Current and Voltage Regulators

The Delco-Remy Current and Voltage Regulators, illustrated in Fig. 5, consist of a cut-out relay, a vibrating current regulator unit, and a vibrating voltage regulator unit mounted for convenience on the same base and enclosed by the same cover. On some models an extra set of contact points are incorporated on the armature of the cut-out relay to provide an added safety device in the starting motor solenoid relay circuit. The terminal and auxiliary set of contact points are insulated from and are not a part of the generating system. Refer to Fig. 6 for circuit diagram.

The cut-out relay, vibrating voltage regulator unit, and vibrating current regulator unit operate as previously described. This type regulator is designed to be used with shunt generators.

The voltage regulator units are also overcompensated for temperature so they have a lower voltage setting when hot.

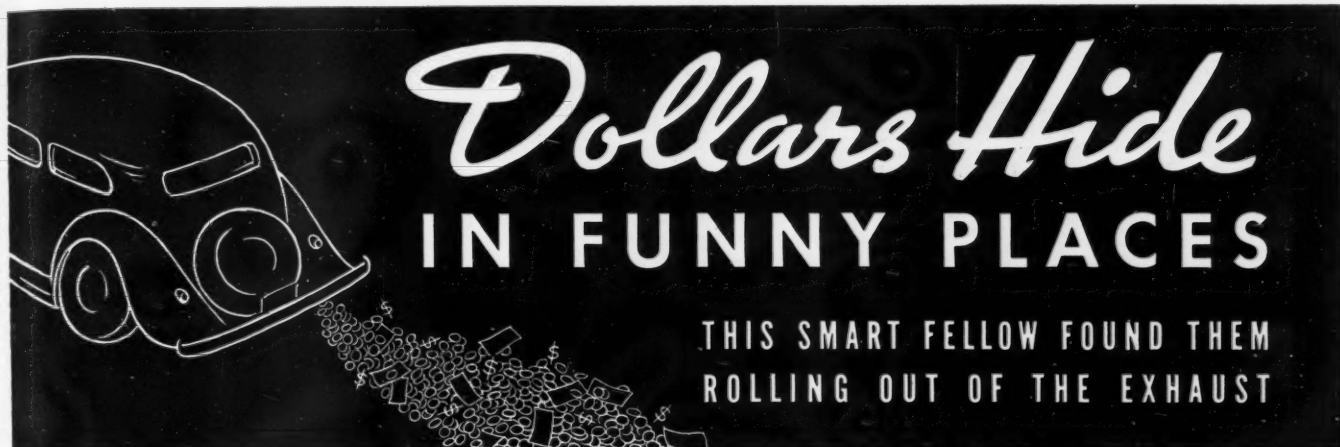
### Procedure for Checking the Current and Voltage Regulator

**CUT-OUT RELAY**—Connect an accurate reading voltmeter and ammeter as illustrated in Fig. 7. Gradually increase engine speed and note voltage at which the cut-out relay contact points close. Decrease the engine speed and note the reverse current at which the contact points open. If necessary, adjust according to instructions given under CUT-OUT RELAY ADJUSTMENTS.

**VOLTAGE REGULATOR UNIT**—With the meters connected as in Fig. 8, gradually increase the engine speed until the generator is charging 8-10 amperes at a generator speed of 2000-3000 r.p.m. and operate until the

(Continued on page 64)



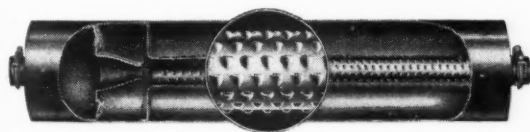


# Dollars Hide IN FUNNY PLACES

THIS SMART FELLOW FOUND THEM  
ROLLING OUT OF THE EXHAUST

## THE "ALL 4" TUNE-UP PLAN COSTS NOTHING TO TRY AND YOU'LL FIND *Dollars*, TOO!

On every tune-up job you do, it's profitable to go on beyond the "all 3" cycle of ignition, carburetion and compression. Standardize on the new "all 4" plan which includes the exhaust system. Many cars have defective mufflers, leaking and broken pipes or connections. Be the smart fellow that makes extra service profits repairing exhaust system defects. Thus, you'll protect your customers against dangerous carbon monoxide gas and improve motor performance as well. You can merchandise exhaust system service with free Walker inspection tags and other sales helps available for your use.



Walker Exhaust Silencers, a complete line of sizes including Direct Flow, Tri-Flow, Oval Tri-Flow and Resonator types for cars, trucks and buses. All have the patented louvered tube which tests have proved give the most efficient combination of silence and low back pressure. Accuracy of Silencer specifications insures perfect fit. Other features that contribute to better performance and gas-tight installations are new 360-degree clamps and a complete line of exhaust and tail pipes. Order Silencers from your jobber.

WALKER MANUFACTURING CO., Racine, Wis.  
Makers also of Walker Jacks and Walker Electric Lifts



## WALKER EXHAUST SILENCERS

DIRECT FLOW, TRI-FLOW, OVAL TRI-FLOW AND RESONATOR TYPES

## Current Control

(Continued from page 62)

regulator reaches operating temperature. Retard the generator speed until the relay contact points open. Then increase the generator speed to 2000-3000 r.p.m. and with 8-10 amperes flowing, check the voltage at which the voltage regulator unit is operating. Refer to VOLTAGE REGULATOR UNIT ADJUSTMENTS for adjustment procedure. VOLTAGE REGULATOR MUST BE CHECKED HOT (150 deg.) TO BE SURE IT IS OPERATING PROPERLY. COVER MUST BE IN PLACE WHEN CHECKING VOLTAGE.

NOTE: In order to maintain the proper output, it may be necessary to insert a variable resistance of  $\frac{1}{4}$  ohm in the charging circuit and cut in resistance until the proper output is obtained. In using the AVR or similar tester, it is only necessary to turn the resistance knob. If the charging rate is less than 8 amperes with all the resistance out of the circuit, turn on the lights in order to maintain this output while making check.

**CURRENT REGULATOR UNIT**  
—With the ammeter connected and the "IGN" terminal lead disconnected as in Fig. 9, turn on the lights and

gradually increase the generator speed until the output remains constant. Under this condition the output of the generator will be the amount for which the current regulator unit is set. See ADJUSTMENT OF CURRENT REGULATOR UNIT for method of adjusting the current setting.

### Adjustment of Current Regulator Unit

**CURRENT SETTING**—Bend the lower spring hanger slightly to adjust the current setting. Bending it down to increase the armature spring tension increases the current setting and decreasing the spring tension decreases the current setting. If the correct current setting cannot be obtained by slight changes in the spring tension, clean the contact points.

If, after cleaning the contact points, it is still impossible to obtain the correct voltage setting by small changes of the spring tension, it will be necessary to adjust the AIR GAP, POINT OPENING, GAP BETWEEN FIBER BUMPER AND CONTACT SPRING POST, AND CONTACT POINT SPRING TENSION, as outlined under VOLTAGE REGULATOR UNIT ADJUSTMENTS.

**CURRENT SETTING**—It should now be possible to bend the lower spring hanger, increasing or decreasing the armature spring tension to obtain the correct current setting. Increasing the spring tension increases the current setting.

**NEVER UNDER ANY CONDITION SET ABOVE THE RATED OUTPUT OF THE GENERATOR!**



(Above)  
Thinning stiff  
transmission  
grease

(Below)  
Thawing  
frozen  
hose

## WITH THE VAN DORN ELECTRIC HEAT GUN

**YOU** sell up to a pound more grease every time you drain a transmission or "rear end" in cold weather with the Van Dorn Heat Gun. The Heat Gun throws a concentrated blast of hot air into the housings, thinning the lubricant so you can drain out every last bit. It also saves time on countless other jobs—thawing water-pumps, hose connections, radiators,

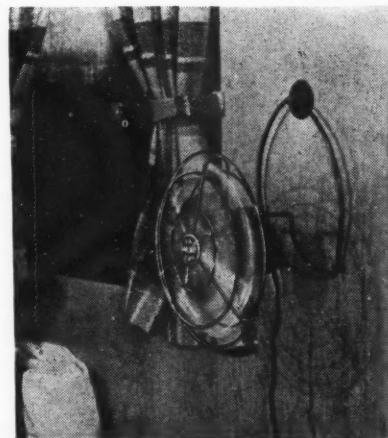
ice on windshields—drying ignition systems—quick-drying touch-up paint jobs. Equipped with six handy attachments which snap on and off instantly. 1,000-watt element, delivers 450°F. Ask your Jobber for a demonstration—or write for complete data. The Van Dorn Electric Tool Co., 727 Joppa Road, Towson, Maryland. (Div. of The Black & Decker Mfg. Co.)

NEW **"Van Dorn"**  
**HEAT GUN**



### Fan For Trailer Use

A handy little utility fan, weighing only slightly over two pounds, with a patented reversible base which makes it possible to stand the fan on



a level surface or hang it on a wall has been introduced by the Lydon-Bricher Mfg. Co., 2500 University Ave., St. Paul, Minn. It has an 8 in. blade, and the motor is either a 6 or 12 volt type for battery operation, or it can also be secured in a 110-volt A. C. type. Retail price \$3.95.



# When a BRAKE MAN needs a friend



This picture tells a story. The customer's brakes need relining. It used to be that the brake man had to guess what type of lining to install, risking a costly "come-back" and a dissatisfied customer. Now he can recommend a proven and certified set of linings that will stay sold.

There are more different types of brakes than ever before. Each requires a specialized lining. What lining should you install on what brake? There wasn't a satisfactory answer until Pittsburgh Testing Laboratory conducted its own series of exhaustive tests on Thermoid Custom-Built Sets and authorized placing their Certificate and Seal of Approval on each set—independent, unbiased authoritative assurance to you (and to your customers) that the lining is *right!* Every box also contains a detailed instruction chart and identification tags to insure proper installation. You can't go wrong with Thermoid Custom-Built Sets.



The only "come-backs" the brake man gets when he installs Thermoid Custom-Built Sets are the satisfied customers who come back for other service and bring their friends. These Sets will help you make brake service a leading, profitable department.

## Thermoid

*Custom-Built*  
**BRAKE LINING SETS**  
CERTIFIED CORRECT FOR EVERY CAR

THERMOID CO., TRENTON, N. J., U. S. A. ★ *In Canada,* THERMOID LTD. TORONTO

# Mechanical Specifications

These Specifications Are Brought Up-to-Date Each Month by the

Line Number	MAKE AND MODEL	Lowest Priced 4-d. Sed. (Dhd.)	Wheelbase (Ins.)	Tire Size (Ins.)	No. of Cylinders, Bore and Stroke	ENGINE														CHASSIS									
						Taxable HP.	Piston Displacement (Cu. Ins.)	Maximum Brake HP. at Specified R.P.M.	Compression Ratio (to-1.)	Displacement Factor	Cylinder Head Material	Camshaft Drive Make	Piston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System Make	Battery Make	Clutch	Type and Make	Gearset Make	Universal Type and Make	Rear Axle Type and Make	Rear Axle Ratio	Front Spring Suspension			
1	Buick.....37-40	950	122	6.50/16	8-3 1/2 x 4 1/2	30.6	248.0	100-3200	5.70	39.2	CI	LB.	Ala.	No.	AC.	SM.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	1 1/2	Own	4.40	IC.			
2	Buick.....37-60	1162	126	7.00/15	8-3 1/2 x 4 1/2	37.8	320.2	130-3400	5.90	42.7	CI	LB.	Ala.	No.	AC.	SM.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	1 1/2	Own	3.90	IC.			
3	Buick.....37-80	1418	131	7.00/16	8-3 1/2 x 4 1/2	37.8	320.2	130-3400	5.90	39.4	CI	LB.	Ala.	No.	AC.	SM.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	1 1/2	Own	4.22	IC.			
4	Buick.....37-90	1966	138	7.50/16	8-3 1/2 x 4 1/2	37.8	320.2	130-3400	5.90	40.2	CI	LB.	Ala.	No.	AC.	SM.	Wal.	D.	Del.	P.Own.	Own.	m-Spi.	1 1/2	Own	4.62	IC.			
5	Cadillac..V8-60 & 65	(f) 124-131	(t)	8-3 1/2 x 4 1/2	39.2	346.0	135-3400	6.25	40.9	CI	Mor.	Ala.	Han.	AC.	Str.	Old.	D.	Del.	P.Long.	Own.	Nb-Mec.	1 1/2	Own	(u)	IC.				
6	Cadillac..V8-70 & 75	(h) 131-38		8-3 1/2 x 4 1/2	39.2	346.0	135-3400	6.25	41.4	CI	Mor.	Ala.	Han.	AC.	Str.	Old.	D.	Del.	P.Long.	Own.	Nb-Mec.	1 1/2	Own	(v)	IC.				
7	Cadillac..V12-85	3535	138	7.50/16	12-3 1/2 x 4	46.9	368.0	150-3600	6.00	40.8	CI	Mor.	Ala.	Han.	AC.	DL.	Own.	D.	Del.	P.Long.	Own.	Nb-Mec.	1 1/2	Own	4.60	IC.			
8	Cadillac..V16-90	7545	154	7.50/17	16-3x4	57.6	452.0	185-3800	6.00	40.5	CI	Mor.	Ala.	Han.	AC.	DL.	Own.	D.	Del.	dp.Own.	Own.	Nb-Mec.	1 1/2	Own	4.64	IC.			
9	Chevrolet..Master	667	112 1/4	6.00/16	6-3 1/2 x 3 3/4	29.4	216.5	85-3200	6.25	35.4	CI	Own.	CI	No.	AC.	Car.	Own.	D.	D.	P.Own.	Own.	m-Own.	1 1/2	Own	3.73	C.			
10	Chevrolet..Mas.DeL.	739	112 1/4	6.00/16	6-3 1/2 x 3 3/4	29.4	216.5	85-3200	6.25	39.0	CI	Own.	CI	No.	AC.	Car.	Own.	D.	D.	P.Own.	Own.	m-Own.	1 1/2	Own	4.22	IC.			
11	Chrysler..Roy. C-16	910	116	6.25/16	6-3 3/4 x 4 1/4	27.3	228.1	93-3600	6.50	38.8	CI*	Mor.	Ala.	Pur.	Bur.	Car.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	1 1/2	Own	4.10	IC.			
12	Chrysler..Imp. C-14	1100	121	6.50/16	8-3 1/4 x 4 1/4	33.8	273.8	110-3600	6.70	41.7	AI	Mor.	Ala.	Pur.	AC.	Str.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	1 1/2	Own	4.10	IC.			
13	Chrysler.Cus.Im.C-15	2060	140	7.50/16	8-3 1/4 x 4 1/4	33.8	323.5	130-3400	6.50		AI	Mor.	Ala.	Pur.	AC.	Str.	NS.	A.	Wil.	P.B&B.	WG.	Nb-UP.	1 1/2	Own	4.55	IC.			
14	Chrysler.Airflow C-17	1610	128	7.50/16	8-3 1/4 x 4 1/4	33.8	323.5	130-3400	6.50	40.3	AI	Mor.	Ala.	Pur.	AC.	Str.	Bur.	A.	Wil.	P.B&B.	WG.	Nb-UP.	1 1/2	Own	4.30	C.			
15	Cord.....812	(i) 125-132		6.50/16	8-3 1/2 x 3 3/4	39.2	288.6	115-3600	6.32	40.3	AI	Whit.	Al.	No.	AC.	Str.	NS.	A.	USL	P.Long.	Own.	Ben.	Tu	Own	4.70	IT.			
16	Cord.....S.C. 812	(j) 125-132		6.50/16	8-3 1/2 x 3 3/4	39.2	288.6	115-4200	6.32	40.3	AI	Whit.	Als.	No.	AC.	Str.	Pratt.	A.	USL	P.Long.	Own.	Ben.	Tu	Own	4.70	IT.			
17	De Soto.....S-3	870	116	6.00/16	6-3 3/4 x 4 1/4	27.3	223.1	93-3600	6.50	39.0	CI*	Mor.	Ala.	Pur.	Bur.	Car.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	1 1/2	Own	4.10	IC.			
18	Dodge.....Six	820	115	6.00/16	6-3 1/4 x 4 1/4	25.3	217.8	87-3600	6.50	38.7	CI	Mor.	Als.	Pur.	AC.	Str.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	1 1/2	Own	4.10	C.			
19	Duesenberg.....J	142-153 1/2	7.00/19"	8-3 1/2 x 4 1/4	45.0	419.7	320-4200	5.20		CI	LB.	Al.	Pur.	Yes.	Str.		D.	Exi.	dpLong.	Own.	m-Spi.	1 1/2	Own		C.				
20	Ford.....V8-60	604 1/2	112	5.50/16	8-2 1/2 x 3 1/2	21.6	136.0	60-4200	6.6	30.4	AI	Gear.	CS.	No.	Yes.	Str.	Own.	O.	Own.	P.	Own.	m-Spi.	3/4	Own	4.44	Tr.			
21	Ford.....V8-85	645 1/2	112	6.00/16	8-3 1/2 x 3 3/4	30.0	221.0	85-3800	6.12	37.9	AI	Gear.	CS.	No.	Yes.	Str.	Own.	O.	Own.	P.Os.	Own.	m-Spi.	3/4	Own	3.78	Tr.			
22	Graham.....85	770	111	(s)	6-3x4	21.6	169.6	70-3500	6.80	35.7	AI	LB.	Als.	No.	Bur.	Mar.	Old.	D.	Wil.	P.Ill.	WG.	Nb-UP.	1 1/2	Spi.	4.55	C.			
23	Graham.....95	905	116	6.00/16	6-3 1/4 x 4	25.3	199.1	85-3800	6.70	37.9	AI	LB.	Als.	No.	Bur.	Mar.	Old.	D.	Wil.	P.Long.	WG.	Nb-UP.	1 1/2	Spi.	4.45	C.			
24	Graham.....S.C. 116	1050	116	6.25/16	6-3 1/4 x 4	25.3	199.1	106-4000	6.70		AI	LB.	Als.	Fram	Bur.	Mar.	Old.	D.	Wil.	P.Long.	WG.	Nb-UP.	1 1/2	Spi.	4.27	C.			
25	Graham.....S.C. 120	1160	116-120	6.50/16	6-3 1/4 x 4 1/4	25.3	217.8	116-4000	6.70		AI	LB.	Als.	Fram	Bur.	Mar.	Old.	D.	Wil.	P.Long.	WG.	Nb-UP.	1 1/2	Spi.	4.27	C.			
26	Hudson.....6-73	945	122	6.00/16	6-3x5	21.6	212.0	101-4000	6.25	36.8	CI*	Ge.	Al.	No.	AC.	Car.	Old.	A.	Nat.	P.Own.	Own.	Nb-Spi.	1 1/2	Own	4.11	C.			
27	Hudson..8, 74-8-87	1010	122, 129	6.25/16	8-3x4 1/2	28.8	254.0	122-4200	6.25	41.2	CI*	Ge.	Al.	No.	AC.	Car.	Old.	A.	Nat.	P.Own.	Own.	Nb-Spi.	1 1/2	Own	4.11	C.			
28	La Salle..V8, 37-50	1260	124	7.00/16	8-3 1/2 x 4 1/4	36.4	322.0	125-3400	6.25	41.0	CI	Mor.	Ala.	Han.	AC.	SC.	Old.	D.	Del.	P.Long.	Own.	Nb-Mec.	1 1/2	Own	3.92	IC.			
29	Lincoln.....V12	4450 1/2	136-145	7.50/17	12-3 1/2 x 4 1/4	46.8	414.0	150-3400	6.38	38.9	AI	Ch.	Ala.	Pur.	Yes.	Str.	Own.	A.	Exi.	P.Long.	Own.	m-Spi.	FF	Tim	4.58	C.			
30	Lincoln-Zephyr	1265 1/2	122	7.00/16	12-2 3/4 x 3 3/4	36.3	267.3	110-3900	6.7	42.8	AI	Gear.	CS.	No.	Yes.	Str.	Own.	O.	Own.	P.Os.	Own.	m-Own.	1 1/2	Own	4.44	Tr.			
31	Nash...Amb. 8, 3720	960	121	6.25/16	6-3 1/2 x 4 1/4	27.3	234.8	93-3400	5.67	36.2	CI	Whit.	Als.	BS.	AC.	Str.	Wal.	A.	USL	P.B&B.	Ot.	Nb-Mec.	1 1/2	Own	4.11	C.			
32	Nash...Amb. 8, 3780	1080	125	7.00/16	8-3 1/2 x 4 1/4	31.2	260.8	105-3400	5.64	35.5	CI	Dia.	Als.	BS.	Bur.	Str.	Wal.	A.	USL	P.B&B.	Ot.	Nb-Mec.	1 1/2	Own	4.10	C.			
33	Nash Lafay 400-3710	810	117	6.00/16	6-3 1/2 x 4 1/4	27.3	234.8	90-3400	5.61	37.4	CI	Whit.	Als.		Bur.	Str.	Wal.	A.	USL	P.B&B.	Ot.	Nb-Mec.	1 1/2	Own	4.11	C.			
34	Oldsmobile.....F37	875	117	6.50/16	6-3 1/2 x 4 1/4	28.4	229.7	95-3400	6.10	38.1	CI	Whit.	Ala.	No.	AC.	Car.	Var.	D.	D.	P.B&B.	Own.	Nb-Mec.	1 1/2	Own	4.37	IC.			
35	Oldsmobile.....L37	990	124	7.00/16	8-3 1/2 x 3 3/4	33.8	257.1	110-3600	6.20	39.1	CI	LB.	Ala.	No.	AC.	Car.	Var.	D.	D.	P.B&B.	Own.	Nb-Mec.	1 1/2	Own	4.37	IC.			
36	Packard.....115C	995	115	6.50/16	6-3 1/2 x 4 1/4	28.3	237.0	100-3600	6.30	39.7	CI	Mor.	Als.	No.	AC.	CG.	Old.	D.	Wil.	P.	Own.	Nb-Mec.	1 1/2	Own	4.36	IC.			
37	Packard.....120C	1170	120	7.00/16	8-3 1/2 x 4 1/4	33.8	282.0	120-3800	6.50	40.7	AI	Mor.	Als.	No.	AC.	SC.	Old.	A.	PD	P.	Own.	Nb-Mec.	1 1/2	Own	4.09	IC.			
38	Packard..1500, 1, 2	2480	127-34-39	7.50/16	8-3 1/2 x 5	32.5	320.0	130-3200	6.50	41.0	AI	Mor.	Als.	Pur.	AC.	Str.	Old.	DA	PD	P.	Own.	Nb-UP.	1 1/2	Own	4.69	IC.			
39	Packard..1506, 7, 8	3670	132-39-44	8.25/16	12-3 1/2 x 4 1/4	56.7	473.0	175-3200	6.40	46.8	AI	Mor.	Als.	Pur.	AC.	Str.	Old.	DA	PD	P.	Own.	Nb-Spi.	1 1/2	Own	4.41	IC.			
40	Pierce-Arrow.....1701	3375	138-144	7.00/17	8-3 1/2 x 5	39.2	385.0	150-3400	6.40	37.6	AI	Whit.	Als.	Pur.	AC.	Str.	Buf.	D.	Wil.	P.Long.	WG.	Nb-UP.	1 1/2	Own	4.58	C.			
41	Pierce-Arrow.....1702	3895	138-144	7.50/17	12-3 1/2 x 4	58.8	462.0	185-3400	6.40	42.0	AI	Whit.	Als.	Pur.	AC.	Str.	Buf.	D.	Wil.	P.Long.	WG.	Nb-UP.	1 1/2	Own	4.58	C.			
42	Pierce-Arrow.....1703	5015	147	7.50/17	12-3 1/2 x 4	58.8	462.0	185-3400	6.40	40.7	AI	Whit.	Als.	Pur.	AC.	Str.	Buf.	D.	Wil.	P.Long.	WG.	Nb-UP.	1 1/2	Own	4.58	C.			
43	Plymouth.....P3	665	112	5.50/16	6-3 1/2 x 4 1/4	23.4	201.3	82-3600	6.70	36.7	CI	Mor.	Ala.	No.	BA.	Car.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	1 1/2	Own	3.90	C.			
44	Plymouth.....P4	745	112	6.00/16	6-3 1/2 x 4 1/4	23.4	201.3	82-3600	6.70	36.5	CI	Mor.	Ala.	No.	BA.	Car.	NS.	A.	Wil.	P.B&B.	Own.	Nb-UP.	1 1/2	Own	4.10	C.			
45	PontiacDeL.6,37-26CA	136	117	6.00/16	6-3 1/2 x 4	28.3	222.7	85-3600	6.20	38.5	CI	Mor.	CHI.	No.	AC.	Car.	BO.	D.	Del.	P.Own.	Own.	Nb-Mec.	1 1/2	Own	4.37	IC.			
46	PontiacDeL.8,37-28A	894	122	6.50/16	8-3 1/2 x 3 3/4	33.8	248.9	99-3800	6.20	40.5	CI	Mor.	CHI.	No.	AC.	Car.	BO.	D.	Del.	P.Own.	Own.	Nb-Mec.	1 1/2	Own	4.37	IC.			
47	Studebaker...Dict. 6	880	116	6.00/16	6-3 1/2																								

## ABBREVIATIONS-General

c—Others also  
 —Measured on rim of Flywheel  
 1/2—Semi-floating  
 3/4—Three-quarter floating  
 \*—Power Clutch  
 †—With clearance of .015 the valve is .004 off its seat.  
 ‡—Does not include Federal Taxes  
 §—Computed on basis of displacement, gear ratio, effective tire diameter, and weight with normal load.

(a) —(—1/4 to +1/2)  
 A—Above (rods removed from)



**Car Manufacturers and Supersede All Others Previously Published**

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## Motor Car Price, Weight and Body Table

Following are delivered prices at factory for cars with standard equipment and include all federal taxes with exception of Ford and Lincoln. Optional equipment, state or local taxes, transportation charges and finance charges are extra.

BODY, MAKE AND MODEL		Delivered Price	Shipping Weight	BODY, MAKE AND MODEL		Delivered Price	Shipping Weight	BODY, MAKE AND MODEL		Delivered Price	Shipping Weight	BODY, MAKE AND MODEL		Delivered Price	Shipping Weight	BODY, MAKE AND MODEL		Delivered Price	Shipping Weight																																																									
BUICK *—6 Wheel Equip ment				CHEVROLET (Cont.)				FORD (Cont.)				LA SALLE				PACKARD *—6 Wheel Equip ment				PLYMOUTH																																																								
Special 40 Sedan, 2d. .... Tour. Sedan, 2d. .... Sedan, 4d. .... Tour. Sedan, 4d. .... Sport Coupe, 2d. .... Conv. Coupe, 2d. .... Conv. Phase, 4d. ....				959 985 995 1021 913 1056 1302	3490 3480 3510 3490 3380 3480 3630	Master De Luxe Sedan, 4d. .... Coach, 2d. .... Tn. Sed., Trk., 2d. .... Spt. Sed., Trk., 4d. .... Bus. Coupe, 2d. .... Sport Coupe, 2d. ....				769 702 720 787 685 723	2935 2910 2935 2960 2840 2880	Fordor Sedan. .... Fordor Tr. Sed. .... Coupe, 5W  De Luxe V8-85 Tudor Sedan. .... Fordor Sedan. .... Roadster. .... Phaeton. .... Coupe, 5W. .... Tud. Tour. Sed. .... Fordor Tr. Sed. .... Cabriolet. .... Conv. Sedan. .... Conv. Cabriolet. .... Club Coupe. ....				670 695 585  673 733 693 748 658 698 758 718 858 758 718	2761 2778 2608  2768 2783 2688 2803 2618 2791 2808 2728 2973 2748 2728	Series 37-50 Sport Coupe, 2d. .... Tour. Sedan, 2d. .... Tour. Sedan, 4d. .... Conv. Coupe, 2d. .... Conv. Sedan, 4d. ....				1155 1275 1320 1350 1680	3675 3780 3810 3715 3850	Model 120-C Sedan. .... Club Sedan. .... Tour. Coupe. .... Sport Coupe. .... Conv. Coupe. .... Conv. Sedan. .... Bus. Coupe. ....				1250 1235 1240 1200 1175 1250 1550 1130	3520 3465 3455 3435 3415 3630 3340	Six P3 Coupe, 2d. .... Sedan, 2d. .... Sedan, 4d. ....  De Luxe Six-P4 Coupe, 2p. .... Coupe, 2-4p. .... Conv. Coupe, 2d. .... Sedan, 2d. .... Sedan, 4d. .... Tour. Sedan, 2d. .... Tour. Sedan, 4d. .... Sedan, 7p. .... Sedan Lim. ....				580 620 665  650 700 830 715 745 725 755 995 1095	2771 2841 2841  2839 2884 2994 2899 2914 2914 3333 2899																																									
Century 60 Sedan, 2d. .... Tour. Sedan, 2d. .... Sedan, 4d. .... Tour. Sedan, 4d. .... Sport Coupe, 2d. .... Conv. Coupe, 2d. .... Conv. Phase, 4d. ....				1172 1197 1207 1233 1187 1269 1524	3720 3750 3750 3750 3680 3715 3840	CHRYSLER  Royal Six Bus. Coupe, 2d. .... Coupe, 2d. .... Conv. Coupe. .... Tour. Bro., 2d. .... Brougham, 2d. .... Tour. Sedan, 4d. .... Conv. Sedan. .... Sedan, 7p., 4d. .... Sed. Lim., 7p., 4d				810 860 1020 880 870 920 1355 1145 1245	3049 3099 3274 3094 3114 3134 3424 3484 3544 3284	Imperial Eight Bus. Coupe, 2d. .... Coupe, 2d. .... Tour. Bro., 2d. .... Tour. Sedan, 4d. .... Conv. Coupe. .... Conv. Sedan, 4d. ....				1030 1070 1070 1100 1170 1500	3374 3449 3544 3564 3609 3824	Custom Imp. 8 Sedan, 4d., 7p. .... Sed. Lim., 4d., 7p				2060 2160 4522 4644	Airflow Sedan, 4d. .... Coupe, 2d. ....				1610 1610	4300 4225	CORD  Westc. Sed., 4d. .... Beverly Sed., 4d. .... Conv. Coupe, 2d. .... Conv. Pha. Sed., 2d. .... Schd. Westh. Sed. .... Schd. Bevlv. Sed. .... Schd. Conv. Cpe. .... Schd. Conv. Sed. .... Cus. Berline. .... Cus. Beverly. .... S. C. Berline. .... S. C. Beverly. ....				2445 2545 2595 2845 2860 2960 3010 3060 2960 3575 3375	3715 3800 3815 3864 3765 3850 3865 3910 4120 4950 4970	DE SOTO  Bus. Coupe, 2d. .... Coupe, rumb., 2d. .... Brougham, 2d. .... Tour. Bro., 2d. .... Sedan, 4d. .... Tour. Sedan, 4d. .... Conv. Coupe. .... Conv. Sedan, 4d. .... Sedan, 7p., 4d. .... Limousine, 7p. ....				770 820 830 840 870 880 975 1300 1120 1220	3038 3068 3123 3148 3123 3148 3225 3441 3451 3451	DODGE  Bus. Coupe, 2d. .... Coupe, 2d. .... Conv. Coupe, 2d. .... Conv. Sedan, 2d. .... Tour. Sedan, 2d. .... Sedan, 4d., 7p. .... Conv. Sedan, 4d. .... Limousine, 4d. ....				715 770 910 780 790 820 1075 1230 1175	2902 2967 3057 2992 2997 2982 2997 3367 3262	FORD  V8-80 Tudor Sedan. .... Tud. Tour. Sed. .... Fordor Sedan. .... Fordor Tr. Sed. .... Coupe, 5W  Standard V8-85 Tudor Sedan. .... Tud. Tour. Sed. ....				579 604 639 684 529  610 635	2513 2523 2543 2553 2383  2728 2760	8-74 De Luxe Coupe, 3p, 2d. .... Brougham, 2d. .... Vict. Coupe, 2d. .... Tour. Bro., 2d. .... Sedan, 4d. .... Tour. Sedan, 4d. .... Conv. Coupe. .... Conv. Bro. ....				875 1035 1035 895 1065 1135 1190 3125	3010 3105 3055 3055 3135 3135 3020	8-75 Custom Coupe, 3p, 2d. .... Brougham, 4d. .... Vict. Coupe, 2d. .... Tour. Bro., 2d. .... Sedan, 2d. .... Tour. Sedan, 2d. .... Conv. Coupe. .... Conv. Bro. ....				1095 1150 1145 1185 1185 1220 1305	3055 3135 3085 3195 3195 3260 3160	8-76 De Luxe Sedan, 4d. .... Tour. Sedan, 4d. ....				1090 1100	3205 3205	8-77 Custom Sedan, 4d. .... Tour. Sedan, 4d. ....				1190 1215	3260 3260
CADILLAC  V8 Series 60 Sport Coupe. .... Tour. Sedan, 4d. .... Conv. Coupe, 2d. .... Conv. Sedan, 4d. ....				1655 1760 1790 2120	3710 3845 3745 3885	V8-Series 65 Tour. Sedan, 4d. ....				2190	4385	V8-Series 70 Sport Coupe. .... Tour. Sedan, 4d. .... Conv. Coupe, 2d. .... Conv. Sedan, 4d. ....				2905 2895 3005 3060	4285 4285 4325 4460	V8-Series 75 Tour. Sedan, 5p. .... Formal Sed., 5p. .... Town Sedan, 5p. .... Conv. Sedan, 5p. .... Tour. Sedan, 7p. .... Imp. Tr. Sed., 7p. .... Sp. I. T. Sed., 7p. .... Bus. Tr. Sed., 8p. .... Bus. I. Tr. Sed., 8p. .... Town Car, 7p. ....				2915 3785 3425 3730 3070 3270 2710 2910 2845 3050 4855	4745 4745 4780 4820 4825 4885 4825 4885 4885 5055	V12-Series 85 Tour. Sedan, 4d. .... Tour. Sedan, 4d. .... Im. Tr. Sed., 4d. .... Town Sedan, 4d. .... Formal Sed., 4d. .... Conv. Sedan, 4d. .... Town Car, 4d. ....				3635 3790 3990 4145 4500 4450 5575	5050 5130 5165 5050 5165 5230	V16-Series 90 Coupe. .... A. D. Coupe. .... Conv. Sedan. .... Town Sedan. .... Sedan, 7p. .... Limousine. .... Imp. Cabriolet. .... Tn. Cabriolet, 5p. .... Tn. Cabriolet, 7p. .... Sedan, 5p. .... Lim. Bro., 7p. .... Imp. Cab., 7p. .... Conv. Coupe, 5p. ....				7745 7900 8205 7595 7695 7900 8155 9125 9230 7645 9125 8205 8205	5840 6050 6100 6085 6180 6210 6190 6100 6390 6190 6190 6210 6000	CHEVROLET  Master Sedan, 4d. .... Coach, 2d. .... Twn. Sed., Trk., 2d. .... Spt. Sed., Trk., 4d. .... Bus. Coupe, 2d. .... Cabriolet, 2d. ....				697 636 854 715 618 724	2845 2800 2830 2885 2770 2790	WILLYS  Model 37 Coupe, 2d. .... Sedan, 4d. .... De L. Coupe. .... De L. Sedan. ....				491 545 535 590	2120 2250 590																													



**L. B. Manning and Bankers  
Buy 30 P.C. of Cord Corp.**



**L. B. Manning**

Working control of the Cord Corp., holding company which itself controls a number of units in the automotive field, has passed to a banking group acting in conjunction with L. B. Manning, who for years has been a close friend and business associate of E. L. Cord. Mr. Cord on Aug. 7 agreed to sell his entire stock holdings in the Cord Corp. to the bankers and Mr. Manning for \$2,632,000, representing 658,000 shares at \$4 a share. The company has outstanding 2,256,700 shares.

In addition to Mr. Manning, who will become president and operating executive, the buyers include Schroder, Rockefeller & Co., Inc., and Emanuel & Co.

Mr. Cord has already ended his connection with the company. It has been reported that he will retire from active business. He is 43.

**Zecol Has New Container**

Zecol, Inc., 841 North Water Street, Milwaukee, Wis., makers of Zecol Wax and Zecol Scum Remover, is now supplying these products in new, convenient-to-use containers. The 8-oz.



tube of scum remover and the attractive jar of wax are companion pieces to Zecol's slogan, "The 60 Minute Way to Automobile Beauty."

**Wrong Number**

Hob Daugherty, of Richmond, Ind., is tempted to run for shelter every time the notorious Brady gang robs a bank. The license plates handed to Hob by the registrar of auto licenses are the legal plates. But—the counterfeit plates used by the robbers have the same numbers. After each bank robbery, Hob's car is stopped and searched, and after the Goodland, Ind., bank was held up a squad armed with machine guns, rifles, pistols and even tear gas surrounded the car. Hob better apply for new plates before some ambitious man-hunter pumps him full of button holes with a tommy gun.

**Bendix Consolidation**

The consolidation into the Bendix Aviation Corporation of the Bendix Products Corporation, marks one step in the development of the management's new policy which contemplates the combining of all the Bendix subsidiaries into one corporate family by Jan. 1, 1938.

The present program calls for the establishment of a finance committee which must pass on all expenditures of all the various divisions; for the reduction, at least for the time being, of amounts spent on research and experimental work, and for the close concentration of related activities into segregated groups.

**'HALLOWELL' Lifetime EQUIPMENT**



Fig. 992

**"HALLOWELL" Semi-Portable WORK BENCH OF STEEL**

In a way it suggests a wheelbarrow; grab the handles and trundle the "HALLOWELL" around anywhere. Let go, and it lands on its plain feet, when at once it becomes a perfectly steady work bench . . . on the very spot you want it—to be moved away again, quickly, easily — so different from ordinary benching, which, oftentimes occupying floor and wall space which could have been used to better advantage.

The handles swing down and out of the way when not in use, and, to prevent shimmying, the casters do not swivel. Write for Bulletin.

**"HALLOWELL" STEEL WORK BENCH**

Strong, rigid, with one piece, smooth steel top, easy to keep clean. Of welded construction, they can't get wobbly—and can't splinter or burn. Best of all, they're inexpensive. Of the 1368 types and sizes, there's one made exactly for you. Bulletin gives details.



Fig. 732 Pat'd. and Pat's. Pending

**"HALLOWELL" STEEL TOOL STAND**

A Stand that can be locked, yet is always open for inspection as to its contents.

Portable—able to be moved from job to job—wherever it's required! No wonder hundreds are used in the motor industries, where its convenient features suit it perfectly to so many needs. There's a type for every purpose—and your copy of our Bulletin will give you the details.



Fig. 1112

**"HALLOWELL" STEEL BENCH DRAWERS**

Can't shrink, swell, stick or jam. Wears far better, lasts much longer than wooden drawers. Has dirt and dust proof cover, and convenient tray for small precision tools. Get Bulletin.

**STANDARD PRESSED STEEL CO.**

BRANCHES

JENKINTOWN, PENNA.

BRANCHES

BOSTON

DETROIT

INDIANAPOLIS

Box 561

CHICAGO

ST. LOUIS

SAN FRANCISCO

### Develops Device to Show Eye's Reaction to Darkness

Perfection of a machine to test automobile, bus and truck drivers for "night-blindness" is announced. Thousands of persons have already been examined with its aid and the Commonwealth of Pennsylvania is to co-operate by sending drivers who have been involved in night accidents for testing. The inventors are Dr. J. B. Feldman and Dr. W. J. Ezickson, both of Philadelphia.

Basis of the development is the relationship of night-blindness, or impairment of vision at night, often manifested by slow readjustment to

darkness after facing bright light, to the quantity of Vitamin A in the body. The doctors found that speedy regeneration of "visual purple" is essential to readjustment of the eyes to darkness after light, and that Vitamin A is necessary to such regeneration after the visual purple has been bleached out by light.

The device which tests the speed of adjustment of the eyes to darkness will therefore permit a report on the deficiency of Vitamin A. The only other factor which can cause night-blindness is some disease of the eyes. Second tests with the machine after an interval of a few weeks for treatment with Vitamin A concentrate are

used to determine whether the night-blindness was caused originally by lack of Vitamin A or by some pathology.

The device consists of a well-lighted ground glass before which the subject is seated for three minutes in order to bleach out the visual purple. When the light is extinguished, there is automatically lighted below it an illuminated arrow. Position of the arrow can be changed by the examiner. It is stated by the doctors that not more than five minutes should elapse between the extinguishment of the bright light before the subject can see the arrow and clearly note its movements. A determination can be made in 10 min.

## SURE PROFITS

follow the sale of Allbestos 21. Satisfaction!  
Safety!

With Allbestos 21, you can take care of every reline job that is brought to you—and do the job right. Allbestos 21 is a universal lining. It fills the gaps in a depleted stock of sets. It meets the demand for a good reline job at an attractive price.

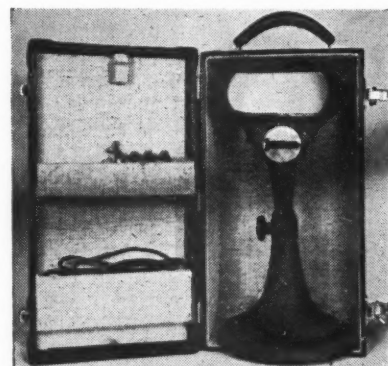
Where an Engineered Set is required Allbestos 21 cannot be excelled when used with any good Moulded Brake Lining.

Allbestos 21 is sold at the No. 35 low-list. It is a quality zinc-wire lining. Cured at a temperature higher than that encountered in service, it will not score, glaze or FADE, despite hills, high speeds or heat. Ground to size. Uniform in density, size and coefficient of friction, it remains constant all the way through. Best for a soft, quick, safe stop! Ask your jobber, or write for sample and prices.

**ALLBESTOS CORPORATION**  
Penna.  
Philadelphia,  
Germantown,

# Allbestos 21

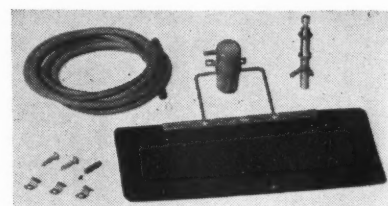
## UNIVERSAL BRAKE LINING



**TESTER** for automobile drivers who may be subject to "night-blindness." The lighted screen at the top bleaches "visual purple" from the subject's eyes. Length of time he takes to be able to see the movements of the illuminated arrow just below, after the screen is darkened, provides a measure of the regeneration—time of the visual purple which controls vision at night.

### Sun Visor Operated by Vacuum

In order to overcome detracting the driver's attention from the road while adjusting the inside sun visor, the Vac-Tro-Visor Company 3831 Northeast Sixty-fourth Avenue, Portland, Ore., has developed a sun visor that is operated by the vacuum from the engine. The visor is constructed of 4 x 10 in. celluloid incorporating a non-



glare feature. The motor is mounted on the windshield headerboard and the control switch is located on the toe board convenient to the driver's left foot. It is not necessary to remove the standard equipment sun visor in order to install the Vac-Tro-Visor; it can be left in position and used as a side shield. For complete information and prices write the manufacturer.



# CRACKS *New Car* BATTERY MARKET FOR 43% PROFIT!

Dealers everywhere hail this big money-maker . . . "The battery guaranteed as long as you own your car!"

The bars are down! For the first time this rich new market is yours . . . the *new car market*! No need now to wait months for replacement sales. Thanks to Kathanode, the amazing long-life battery that's sweeping the country, you can sell the new car owner immediately, even before he runs up 2,000 miles.

This is no idle promise. Already hundreds of dealers have proved that Kathanode new car sales bring profits as high as 43%. On ten sales, you make nearly \$100!

Is that business worth going after? Then go after all the facts about Kathanode. Write today.

**THE KATHANODE CORPORATION**  
NEW YORK • CHICAGO



**YES SIR, I MADE \$92.98 IN  
2 WEEKS SELLING 10  
KATHANODE BATTERIES TO  
NEW CAR OWNERS!**

**H. A. GERBER**, president of the Quick Service Battery Co., St. Paul, Minn., made a gross profit of \$92.98 on ten Kathanode sales to new car owners in just two weeks. Before Kathanode he would have had to sell 32 to 38 ordinary batteries to make the same profit . . . and he would have had no new car market at all.



## ADVERTISED IN THE "POST"

This month, and every month straight through the selling season the sensational new Kathanode story will be told to over 3,000,000 motorists in The Saturday Evening Post. These advertisements, based on an entirely different theme for batteries, will help build sales and profits for you. Watch for them! Put them to work for you!

ALREADY MORE THAN 30,000 DEALERS ARE CASHING IN ON THE

## KATHANODE BATTERY

NOW OFFERED BY THESE LEADING COMPANIES:

Gould Storage Battery Corp. • General Tire & Rubber Co. • National Battery Co. • Phillips Petroleum Co. • The Pure Oil Co. • Richfield Oil Corporation • Vesta Consolidated, Incorporated

**GUARANTEED AS LONG AS YOU OWN YOUR CAR!**

## Ramco Motor Overhaul For Ford Cars

A new and complete overhaul kit for Ford V-8 engines has been announced by the Ramsey Accessories Mfg. Corp., 3693 Forest Park Boulevard, St. Louis, Mo. Each unit consists of a full set of Ramco piston rings and Ramco piston skirt expanders specifically engineered for Ford V-8 motors made during and since 1934. It is a strictly tailor-made kit, not for universal application.

## Brass Fittings Data Book

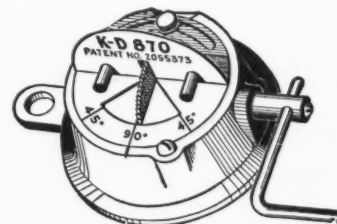
Answers to the questions which are most frequently asked by those who use fittings for copper tubing work as well as handy reference charts for the selection of fittings are included in a new folder which has just been issued by The Imperial Brass Manufacturing Co., Chicago.

To save users' time in selecting fittings there are convenient reference charts and tables, which picture each style of fitting and give the many standard sizes which are available and list prices. In all, approximately 400 types and sizes are listed.

Also provided by the folder are illustrations and size and list price information on over 50 different two and three-way shut-off and drain cocks. Copies of this folder (No. 295) may be obtained from any Imperial jobber or by writing to The Imperial Brass Manufacturing Co., 1200 West Harrison Street, Chicago.

## K-D Announces New Piston Ring Filer

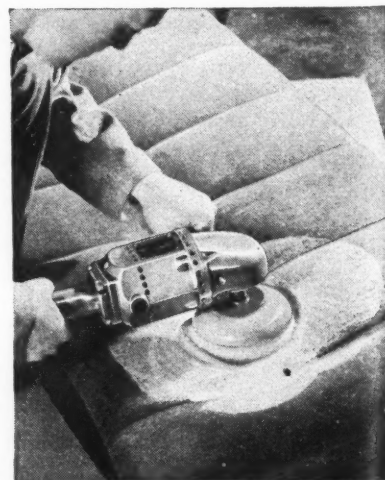
The K-D Mfg. Co., 510 Plum St., Lancaster, Pa., has announced their new No. 870 piston ring filer to eliminate the hand method of rubbing rings on the sides of a file. The machine may be bolted to one of the cylinder head studs, held in a vise or secured to the work bench. Rings are filed perfectly parallel by holding them against the vertical guide



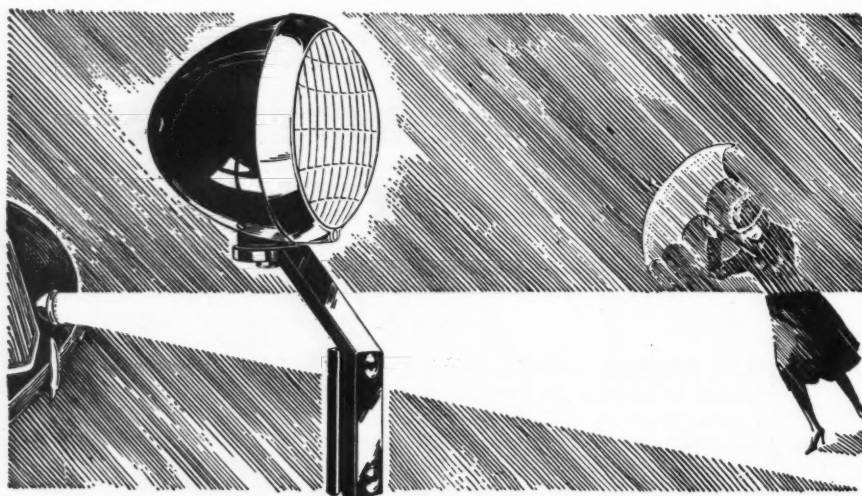
plate, resting on the pins, so that the ends bear on the sides of the cutter file, one on each side. When the crank is turned, the natural drag of cutting pulls the ends back against the guide plates, assuring a square, parallel cut. In addition to the file teeth on the sides of the cutter file, there are saw teeth in its periphery. Removing the ring gage from the filer transforms it into a rotary hack-saw for such jobs as slotting pistons, etc. Cutter files are replaceable.

## Lectro-Kleen Process For Cleaning Cars

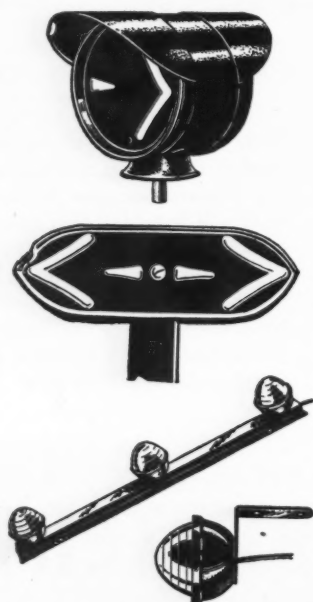
Black & Decker Mfg. Co., Towson, Md., has announced their new Lectro-Kleen Process for the inside and outside cleaning of automobiles. After cleaning the upholstery with the Vackar cleaner, it is scrubbed with



the special Lectro-Kleener, a non-inflammable cleaning fluid which removes dirt and grease quickly and will not injure the finest fabrics, car finish or hands. This scrubbing is done with the Black & Decker standard polisher, using a rotary bristle brush. After scrubbing, the Vackar is again used to remove excess moisture, speed up drying and raise the nap of the fabrics.



## IT LAYS A BEAM LIKE THIS



Arrow Driving Lamps mark a new advance in visibility through fog, snow, sleet, and rain. A special amber lens captures all the fringe rays and concentrates them into a wide, low, rectangular beam of great concentration. No stray rays to reflect off fog and obscure the vision. No glare in other drivers' eyes. Set low, they make the roadside visible through the heaviest fogs.

Install this sturdy, streamlined, weatherproof, successful fog light. Write for our free, new Safety Catalogue.

## Arrow Signals Legally Approved

Install Arrow Directional Signals, not just to be within the law, but to add safety to "payloads." The Arrow Line includes all popular approved combinations. Arrow is the choice of fleet operators and truck manufacturers everywhere.

Ask your  
Jobber

**ARROW SAFETY  
DEVICE COMPANY, INC.**  
MEDFORD, NEW JERSEY



# "23<sup>6</sup>/<sub>7</sub> MILES PER GALLON IN OUR CHRYSLER ROYAL!"

—FREDERICK E. DUFFIELD,  
San Francisco, Calif.



"MY WIFE and I recently drove from San Francisco to Seattle. Upon checking our mileage, we were unable to believe our Chrysler Royal could be so economical.

"Subsequent check-ups, however proved that we were getting slightly less than 24 miles to the gallon—23 <sup>6</sup>/<sub>7</sub> to be exact. The new Gold Seal Engine is truly a marvel!"

**CHRYSLER INVADES  
THE LOW-PRICED FIELD!**

**WHEN THOUSANDS OF OWNERS TALK  
LIKE THIS . . . . IT'S NO WONDER  
CHRYSLER DEALERS ARE MAKING HISTORY!**

## Clean-Up with Showers

(Continued from page 22)

a connection was welded for a stove-pipe and openings were welded for the fire door and draft. This drum was then fitted inside the larger drum and all joints were welded water-tight. The heater was then bricked in to prevent radiation.

By piping the water from the overhead tank to the bottom of the heater, the inner drum was completely surrounded with water. Then, by connecting a pipe from the top of the boiler to the bath-house, 8 feet

away, hot water was easily supplied to the two showers with very little fire. The fire, in this case was made from wood, although waste material around the garage often supplies all the heat required to boil the water in a few minutes.

A branch pipe directly from the supply pipe to the shower supplies the cold water. Hot and cold water valves regulate the temperature at the sprinklers, which are adjustable to overhead or from the side.

So popular has this feature become that in two months it had paid for itself and it is now a source of comfortable profit, with very little extra work for the garage attendants. Towels and soap are not supplied.

## Make Them Laugh

(Continued from page 39)

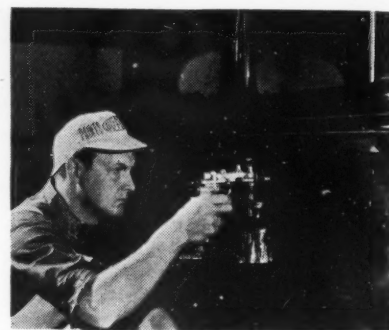
brication" and is a much more pleasant reminder of a necessary grease job, Mr. Couch says, than a workman in greasy coveralls busy on a job.

A comfortable waiting room and clean, convenient rest rooms add to the attractiveness of the station. These things, with good service and Mr. Couch's personality are building steady customers. The "friendly" ads are bringing more.

## New Automotive Finish

Announced by duPont

A new automotive finish to be known as automotive Pyralux is announced by E. I. duPont de Nemours & Co., Wilmington, Del. Designed

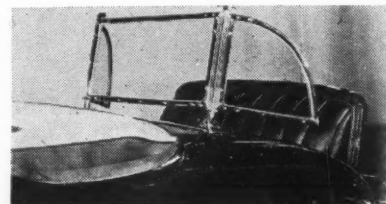


chiefly for touching up synthetic resin finishes and for recoloring used cars, it combines the quick-drying qualities of lacquers and the lustre of synthetic resin enamels, requiring no rubbing. Its chalking resistance is said to be comparable to that of baking enamel. The new finish is offered in black and 26 shades.

## Windshield For

Rumble Seat

Designed to fit the rumble seat compartment of any car, the new collapsible windshield introduced by General Accessories, Inc., 225 West Fifty-seventh Street, New York City, is easily installed and adjusted. Mouldings are of seamless brass, chrome plated, and the shield is of special



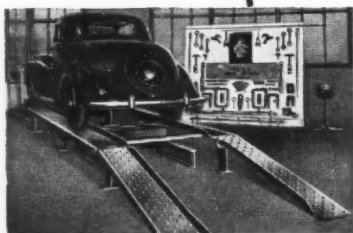
Safetee glass. Can be raised or lowered in less than a minute, and when not in use can be folded into the compartment so as not to interfere with closing the rear deck lid. List price, \$85.



MULLER BROS., Hollywood, Cal.

GO BEAR!

and here's what they say:



"AFTER carefully investigating other lines of similar equipment, we chose the Bear, not only for its superiority, but also for the fine display and set-up it makes. We are well pleased with our purchase and feel our judgment in buying it proved correct."

Muller Bros. are reputed to operate the world's largest Super Service Station. But regardless of the size of your shop, you can't afford to be without Bear Equipment and the Bear dealer advertising program. Let Bear show you how to solve the floor space problem! Write today for complete details and Easy Payment Plan.

This Bear Frame and Axle Straightening and Wheel Alining Equipment illustrated here has more earning power per square foot than any other type of equipment.



**BEAR** Safety Equipment  
BEAR MFG. CO., ROCK ISLAND, ILL.



# COMPLETE SALES AND SERVICE HELPS

## *step up Anti-freeze Dealer Profits*



- 1** EXCLUSIVE NOR'WAY DIRECT-READING TESTER
- 2** 1937-1938 NOR'WAY SLIDE RULE CALCULATOR
- 3** LARGE, COLORFUL NOR'WAY STATION BANNERS
- 4** UNDER-THE-HOOD TAGS FOR REPEAT BUSINESS

*plus other  
effective "helps"  
not shown in  
photograph*

**For the complete Nor'way Sales Plan  
MAIL THE COUPON NOW**

**COMMERCIAL SOLVENTS CORPORATION  
NEW YORK CENTRAL BUILDING  
NEW YORK, N. Y.**



**COMMERCIAL SOLVENTS CORPORATION  
New York Central Building  
New York, N. Y.**

Gentlemen:

Please send me complete information on your Nor'way anti-freeze proposition.

Dealer's Name \_\_\_\_\_

Address \_\_\_\_\_

My Jobber Is \_\_\_\_\_

## Sludge in Pans

(Continued from page 37)

a bottle. Still, on any known analysis of crankcase drainings, this sample may show that it is perfectly good crankcase lubricant. If it is not, the inadequacy will be due to some factor other than one having to do with the discoloration. These statements do not apply to the black, opaque drainings which carry a large percentage of colloidal materials.

Most fleet operators can remember attempting at some time in their careers, to relieve sticky valves by pouring kerosene or carbon tetrachlo-

ride through the choke of the carburetor, or by letting the windshield wiper hose draw it from a container. This process achieved the same results as the application of sludge solvents or removers do in a scientific way. Doubtless the introduction of kerosene or carbon tetrachloride through the carburetor had a beneficial effect on the piston rings, as it is a pretty safe guess that if the valves were being stuck sufficiently to resist closing, the piston rings were stuck in one position, which did not permit them to follow the cylinder.

Another shop method of relieving a sludge condition is to give the engine an internal bath with flushing oil, which is usually a thin, cheap red

oil. It is done at a drain period and the engine is idled with a crankcase full of flushing oil for a few minutes then drained and the regular lubricant is put into the oil pan. Doubtless this is still a good method, but special sludge solvents should do a better job, because instead of taking a material that just happened to be at hand to clean out the engine, the solvent manufacturers have made a study of the material which must be dissolved or removed and then compounded a substance to do the job. Some of these compounds are used as flushing material and others are for adding to the regular lubricant.

Oil filters can be used to good advantage in gathering and localizing the water, foreign matter and colloidal free carbon in the lubricant before it has had a chance to combine and cause trouble, provided the filtering element is changed frequently enough. The job of preventing these things from getting into the oil seems hopeless, and the next best thing to do is to remove them as quickly as possible once they are there by means of a filter. Aiding the filter is the crankcase ventilating apparatus, which permits much of the water to escape as steam.

One fleet operator who had an engine in a peculiar installation, found that it was sludging very badly. Other engines on similar work were not causing much trouble in this respect, which resulted in the one engine being the subject of an investigation. It was found that the engine had been tilted from the vertical for accessibility to accessories and the engine had been tilted enough so that the oil in the reservoir blocked off the intake part of the crankcase ventilation system.

Several fleet operators who had been troubled with short-lived piston rings and valves found that oil filters serviced religiously helped lengthen the lives of these parts. Some of them went so far as to say that it had eliminated sludge as a serious problem so far as they were concerned.

Some oils are much more resistant to sludging than others. Just what makes an oil resistant to sludge is a matter of dispute among highly trained refinery technicians so beyond making note of the fact that there is a difference this article will not enter the argument.

When it is all summed up there are a number of things that repairmen can do to eliminate sludging. They are:

1. Use an oil that resists sludging. If the type of oil is changed for this reason make sure that the second oil does not get blamed for sludge created by the first oil. Sometimes the second oil will have a washing effect and sludge will show in the drainings when the second oil is in reality getting rid of sludge created by the first oil.

2. Equip the engine with oil filters and service them as often as required.
3. Install thermostats radiator covers or change fan pulleys so that the engine operates at an efficient temperature.

4. Make sure that the crankcase breathing apparatus is operating.

5. Make periodic use of sludge solvents or removers.

## Saves Time and Steps!

### New HERBRAND ROLLWAY WORKSHOP

Consists of a complete assortment of 101 necessary tools, a removable chest and a portable workbench.

This "Modern Workshop" is designed so that it can be pushed from job to job . . . It glides along on smooth running casters, and keeps every tool within easy reach . . . No lost tools, wasted time or steps, and no more searching for misplaced tools.

The Rollway is constructed from heavy gauge steel and securely bolted for rigidity. It has a large drawer  $3\frac{7}{8}$ " deep, and a lower compartment provides ample space for bulky tools, accessories, coveralls and other articles.

Both Rollway and Chest are finished in attractive baked blue wrinkle finish, and they are fitted with nickeled locking hasps.

The Improved Magic Chest, with a  $4\frac{1}{2}$ " deep drawer fits on top of the Rollway and can be completely removed—thereby providing an all purpose work table . . . Jobs that would take hours of toilsome labor and hundreds of wasted steps in an ordinary shop can be handled with convenience, efficiency and greater profit in the shop that does have a Rollway Workshop.

This great Combination (No. MC-102) consists of the Magic Chest, 101 Tools, and the Rollway Bench . . . Complete, \$97.70. The Rollway Workbench is  $31\frac{1}{2}$ " high,  $24\frac{3}{4}$ " wide, 19" deep. (Rollway Workbench, only \$15.60.)



LOOK FOR THIS MARK OF QUALITY  
When buying tools, be sure to specify Herbrand, for they represent the highest quality that money can buy. If you have not seen our new Catalog No. 50-M, ask your jobber, or write us today, and remember—Herbrand jobbers are a source for every tool need.



THE HERBRAND CORPORATION • Fremont, Ohio

Drop-Forged Tools Since 1881





*Shorter Days and  
Longer Nights  
CAN BRING ADDED  
PROFITS WITH*

## GUIDE HEADLAMP TESTERS

With the seasonal increase in night driving, there is naturally a greater need for headlamp adjustment, as well as an increased demand for headlamp parts. With a Guide Headlamp Tester, you can render a very necessary service and, at the same time, increase your profits. Guide Headlamp Test-

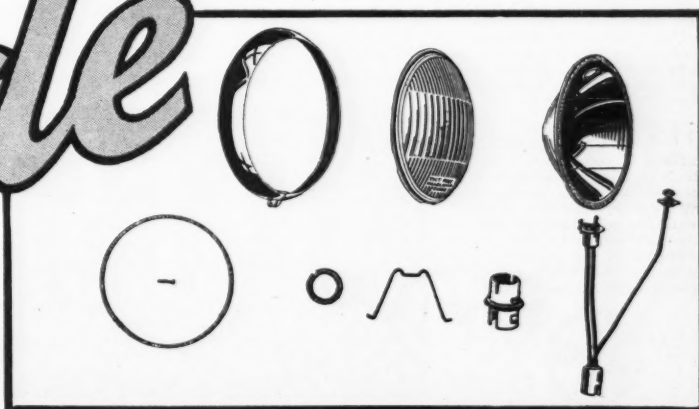
ers are available in two models—single or double unit type.

It will pay you to get full information about the Guide Headlamp Testers—especially at this time of the year. Order from your nearest Authorized Guide Lamp Distributor or United Motors Branch.



*Guide*

LAMP DIVISION  
General Motors Corporation  
Anderson, Ind.



## Winter Business

(Continued from page 19)

And it is on the basis of freedom from hard starting and good performance that the job is sold.

Winter lubrication jobs are also of major importance in increasing the profits of winter business. As a result of the advertising that has been done by the major oil companies, the sale of winter lubricants meets with little sales resistance. To get maximum performance, easy starting and reduced wear of the various units winter lubricants must be used.

When it comes to winter accessories, a list as long as your arm could

be prepared. The more popular are heaters, skid chains, chain repair links, tires, batteries, windshield defrosters, windshield wipers and blades.

Be sure you have a stock on hand and have your sales patter down, so when a customer comes in you will be ready.

But, it is of the utmost importance that every shop should prepare, well in advance of cold weather, all its sales talk and advertising. In this connection, manufacturers of anti-freeze, batteries, tires, oil and lubricants, heaters, skid chains and other winter parts and accessories are glad to supply advertising folders, window and counter displays and direct mail letters to be sent to car owners by

the individual shops so as to increase their business.

However, many prepare their own direct mail letters. In addition, MOTOR AGE each year prepares special letters for shops. Write, if you want any assistance in the form of direct mail letters or special advice that will help make this winter the best selling season you have ever had.

## 37 Years A Mechanic

(Continued from page 26)

Buick, Lozier and Detroit. From 1915 to 1934, Mr. Reibenstein was associated with the Cook & Gill Company, another active and outstanding automobile concern, and among other makes featured the Graham cars. Due to economic changes they retired and the following year Herman, as he is known in the Great Northwest, became associated with the Windolph Motor Company as head mechanic, always turning out the kind of work that made repeat business for the firm. Then came a year or more of leisure, and now Herman brings his wealth of automotive experience to another new field with him and has become associated with Loder Brothers, Graham dealers at Salem, Ore.

It was early in 1909 that Mr. Reibenstein was granted automobile license No. 1 in the State of Oregon, permitting him to operate automobiles driven by any kind of power, and in addition was presented with a metal badge, which he still retains. By "Any Kind of Power" was meant either steam, electric or gas cars, and during that year there were but three drivers in the state who had the necessary qualifications, and were able to pass successfully both written and oral examinations. The license fee was \$3 for one car and a combination rate of \$5 if you qualified on all three makes.

In recalling some experiences of the olden days, Mr. Reibenstein remembered that while testing one at an 80-mile speed up the well-known Columbia Highway he was overhauled by a faster motorcycle copper, who, refusing to accept explanations, brought him into court. After securing the facts the Judge was impressed with the driver's license No. 1, shook hands with Mr. R., remitted the \$2 fine with the remark, "Wish we had more drivers of your high caliber."

## Brunner Has New Line Of Air Compressors

The Brunner Mfg. Co., 1821 Broad St., Utica, N. Y., has announced a new line of air compressors consisting of three completely assembled outfits, fully automatic, and at new low prices. Model 1350 is a low-priced, quarter-horsepower outfit for one tire line only. Model 2010 is a half-horsepower outfit for small garages and filling stations where free air facilities are desired. Model 3250 is for operating a lift and small air tools in addition to free air. Full information is given in the new Brunner catalog and Manual No. 31, which will be mailed free upon request.



## PROFIT BY CUSTOMER GRATITUDE—

### Install an Alkosave

### IT MAKES ANY ANTI-FREEZE LAST

Alkosave is a scientifically engineered valve which safely seals the cooling system—making it air-tight. It practically eliminates the loss of anti-freeze, and water, caused by evaporation. No more fumes!

Alkosave is foolproof. Safety valve opens automatically to permit steam to escape should engine trouble cause overheating.



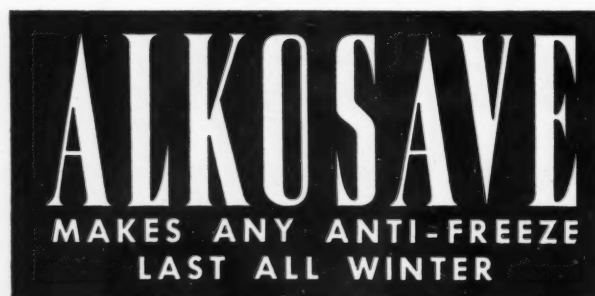
#### INSTALLATION:

Simply slip the Alkosave rubber bushing over the bottom of the radiator over-flow pipe. Installed by anyone, in one minute, without tools. Nothing to get out of order. Rustproof! List price—89c.

**TESTS:** Last winter one fleet saved 1,000 gallons of anti-freeze, thanks to the use of Alkosave. In a summer test one group of vehicles in another fleet equipped with Alkosave used one-half as much water as those vehicles not equipped—proof positive of safe sealing. (Names given upon request.)



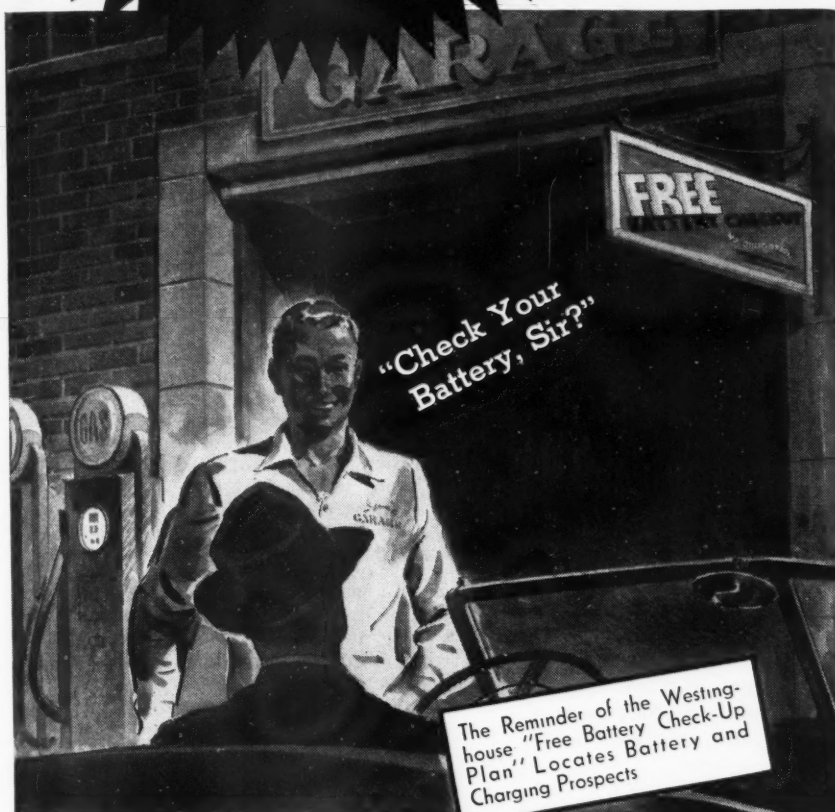
Alkosave is made by Evans Products Co. of Detroit, in itself a guarantee of the quality of the product. Nationally advertised. Low list—89c per unit. Only one model. Small investment—quick turnover—very generous profit. Every car, truck and bus a prospect. See your jobber, or write Evans Products Co., 392 Broad Street, Newark, N. J.





**PAYS  
FOR ITSELF  
IN 2 WEEKS**

# New Westinghouse Rectigon BATTERY CHARGER



**T**HE NEW Westinghouse Rectigon Battery Charger will pay for itself in two weeks. Seems hard to believe, and we had to rub our own eyes twice to be sure. *Newly designed* this year, the Westinghouse Rectigon Battery Charger has a very high efficiency and is a good income producer. What's more, you are not asked to believe mere claims. We are ready to give you proof that it can pay for itself in two weeks.

With the new Westinghouse Rectigon Free Battery Check-up plan you really get set up for battery charging and battery replacement business. Rectigon charging service, like any of your shop service facilities, must be merchandised and brought to the attention of your customers. Therefore, Rectigon offers you a sales plan and all the necessary advertising and selling tools Free.

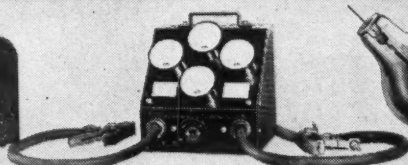
With the FREE BATTERY CHECK-UP publicity material—window streamers, wall banners, you will announce your new service. And the battery check-up tags will remind your customers that their battery needs service. What's more, it will keep you in touch with the condition of your customers' battery and give you the inside track for replacement battery sales.

J20383

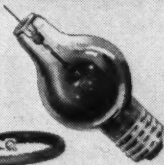
Westinghouse Elec. & Mfg. Co.  
East Pittsburgh, Pa.



Available in wall and service unit types. Adjustable charging current. Six battery rectigon unit priced as low as \$36.00.



Rectigon Battery Testers show accurately condition of each cell under true load conditions. Wall and bench models.



Rectigon replacement bulbs customarily exceed the guarantee of 1200 hours. Six ampere bulb at a new low price of \$6.00.



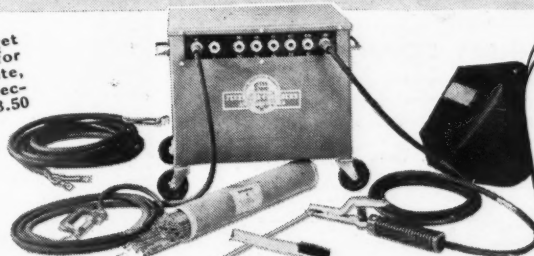
## Westinghouse

Westinghouse Elec. & Mfg. Co.  
East Pittsburgh, Pa.  
Division 7-N

Please send me full information on your:

- ☐ Battery Check-Up Plan.
- ☐ Proof that it "Pays for Itself in 2 Weeks."
- ☐ Midget Marvel Welder.

Sensational new FlexArc Midget Marvel A-C Welder. Ideal for small repair shops. Complete, ready to weld, with hood, electrodes and cable. Only \$123.50 COMPLETE.



### Adapter Makes Older Model Generators Available, 1937 Cars

This new product enables garage men, fleet owners and others to use previous models of Chevrolet generators on the 1937 car. The Able Generator Adapter, costing but a few cents, in effect, increases any stock of generators by making older models of generators available for the 1937 Chevrolet car.

This new device requires only one minute to apply and is individually packaged in an attractive carton.

For further information write the Able Products Company, 356 North Gay Street, Baltimore, Maryland.

### Auto-Lite Spark Plugs Now Used by Plymouth

The new Auto-Lite spark plug, manufactured by the Electric Auto-Lite Company of Toledo, has been adopted as standard equipment by the Chrysler Corporation for all standard models of the Plymouth cars, and all Plymouth T-50 commercial cars.

A special porcelain, Ziram, developed by Auto-Lite's own ceramic division to obtain a high quotient of heat control, and Konium, a new electrode metal developed by Auto-Lite, are used in the manufacture of the new type of spark plugs. The photoelectric eye also is used in setting spark gaps.

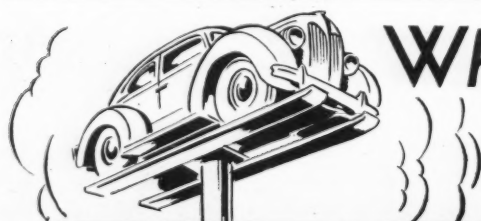
### July Factory Shipments Estimated at 445,550 Units

July shipments from automobile factories in the United States and Canada amounted to 445,550 units—a decrease of 1 per cent under the same month last year—the Automobile Manufacturers Association disclosed today in its preliminary estimate of the industry's operations for the month.

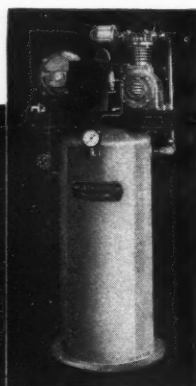
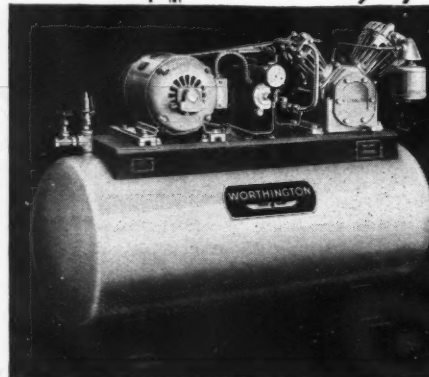
The industry's shipments for the first seven months of the current year were placed at 3,362,970. This was 10 per cent above the corresponding period last year and was the largest volume for the period ever reported by the industry except in 1929.

The association's estimate is summarized below:

	Shipments for Entire Industry
July, 1937	445,550
June, 1937	521,139
July, 1936	451,206
7 mos., 1937	3,362,970
7 mos., 1936	3,045,714



## What Price Air?



**BOTH VERTICAL and HORIZONTAL**

**T**RUE, you don't sell air as air in a service station, but you are selling it with practically every service you give. You have to have air on tap, day and night, or you might as well shut up shop. Naturally you want to produce air at the lowest possible cost.

Worthington knows the service man's problem and has developed a line of dependable, low-power-consuming compressors that don't run into big money. Furthermore, the new Worthington easy time payment plan, through the jobber, makes them easy to buy. *Worthington Compressors are real machinery*, designed and built for continuous uninterrupted service... and low power and maintenance costs.

Send for illustrated bulletins describing the Worthington Line of Compressors... and for particulars about the new liberal Time Payment Plan.



# WORTHINGTON



**WORTHINGTON PUMP AND MACHINERY CORPORATION**

General Offices: HARRISON, N. J. • Offices and jobbers in principal cities

WORTHINGTON PUMP AND MACHINERY CORPORATION • HARRISON, N. J.

Send me, as checked... Automotive Compressor Literature ☐... Time Payment Plan ☐

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

AU 7-7

### Gulf Appoints Wintergust

"Big Ed" Wintergust, one of the most beloved and colorful figures in the automobile racing game for the last seventeen years, has been named official auto racing representative of the Gulf Oil Corporation.

Announcement of Wintergust's appointment, to take effect at once, has been made by Mr. H. P. Hobart, General Manager, Lubricating Oil Sales. His duties will be to keep in close contact with racing events and the racing fraternity throughout the year, and to promote the use of Gulf fuels and lubricants at all major races and record-making runs which operate under sanction from the American Automobile Association.

Earlier in the year Harry A. Miller, famous builder of racing engines, was appointed to head Gulf's Experimental Engine Division and the appointment of Wintergust rounds out Gulf's representation on the speedways of the nation. Wintergust will be attached to the staff of the Experimental Engine Division.





# "...IT IS THE ONLY REAL CLEANER

... it has brought me new customers  
and satisfied old ones"—writes garage owner

H. Paul Rhodes

—read his letter

## "EVEREADY" Cooling System Cleaner

**Actually—**

**Removes Grease!**

**Cuts Hard Rust Scale!**

**Leaves Inside Bright  
and Shiny!**

National Carbon Co., Inc.  
New York, N. Y.

Gentlemen:

I have used your Eveready Cleaner since it  
was first introduced - over a year ago - and I believe you  
would like to know of my experience with it.

In all my experience with Radiator Cleaners--  
and I have used hundreds of them -- Eveready is the first  
one I have found that will remove both grease and hard rust  
scale and leave the inside of the radiator bright and shiny.  
I like the way it dissolves rust so that you can get it all out  
of the cooling system. It is also a great satisfaction to know  
that it will not harm any part of the cooling system.

In my opinion it is the only real Cleaner and  
it certainly lives up to every claim you make for it. It has  
brought me new customers and satisfied my old ones.

Yours very truly,

*H. Paul Rhodes*  
Scotrun Garage, Scotrun, Pa.  
H. Paul Rhodes

The word "Eveready" is a trade-  
mark of National Carbon Co., Inc.



H. Paul Rhodes, of  
Scotrun, Pa., who has  
found "Eveready"  
Cleaner far superior to  
the hundreds of other  
cleaners he has used.



MADE BY THE MAKERS OF "PRESTONE" ANTI-FREEZE

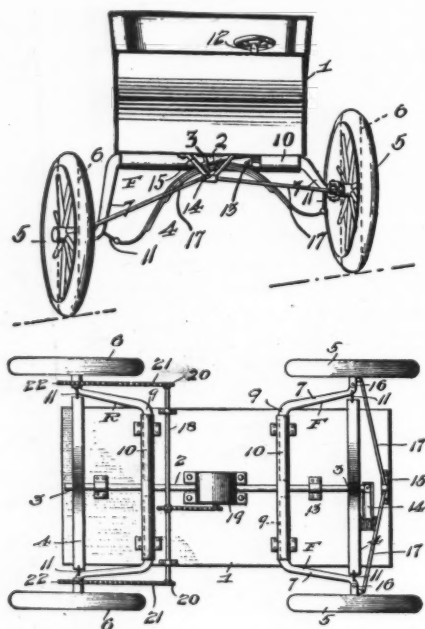
MOTOR AGE, September, 1937

When writing to advertisers please mention Motor Age

## Knee Action? Independent Springing? New in 1904?

**D**OES your car have knee-action on all four wheels? Does it skid on a curve? And as for steering! Say, can you turn a corner just by tipping the body toward the inside, just like riding a bicycle "no hand"? If you can't, your car must be terribly out of date, because all this was patented in this country 'way back in 1904! It's a fact! Patent No. 776,078 issued Nov. 29, 1904, to Mr. John F. Murphy of Jackson, Mich., "Running gear for vehicles" it was called, and specified for use in connection with "speed-carriages of the motor-vehicle or automobile type."

It called for loosely mounting the



body on a shaft running fore and aft through the center, each end of the shaft being rigidly attached to a transverse spring. The ends of the springs are attached by means of shackles to the nearest axle. The axles, by the way, are crank-shaped, one for each wheel, and are attached to the body about one-third of the way back from each end. Their mounting brackets are sleeves, allow-

ing the crank to swing freely, much the same as the present-day starting crank would hang if it were just pushed through the radiator grille and allowed to swing. After mounting the axles to the body, the free ends are brought up to meet the spring shackles, thus supporting the weight of the body and at the same time creating independent suspension for each wheel.

Steering? Oh, that's easy. You know that when you tip a wheel from its vertical position it wants to roll in a circle in the direction in which it was tipped. So, if you tip the body of the car, the horizontal plane of the axle changes (since it is mounted to the body) and the wheels just naturally run in the direction in which the body is tipped. Then, too, with the body of the car tipped toward the inside of the circle, the center of gravity is shifted to the inside, reducing the tendency to skid. No, you don't have to lean to one side to tip the body. A steering tube and worm, rigidly attached to the body, meshes with an arm that is rigidly attached to the end of the center shaft on which the body is loosely mounted. So, simply by turning the steering worm, you screw down one side of the body, and there you are. Turning the wheels will be further assisted if you attach a sort of tie rod from a bracket on the center of the front of the body out to each of the front spindles. When the body tips, the distance between the bracket and the spindle changes, so the tie rods help to push or pull the wheels.

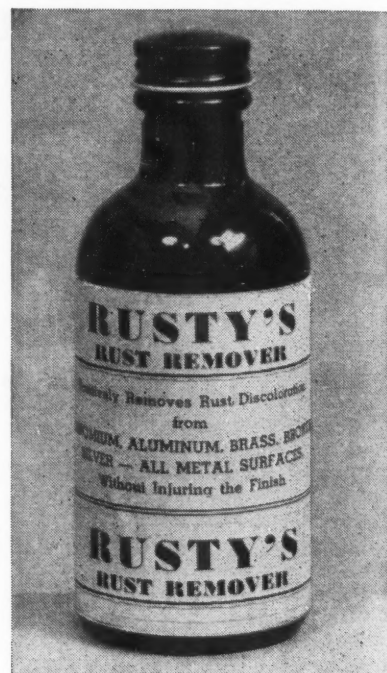
According to our information, the patent was issued without a model having been presented, so we can't swear that it works as described. Still, it's a good idea.

## Crescent Wins Safety Award

The Crescent Co., Pawtucket, R. I., manufacturer of Wiry Joe Automotive Cables, has received a Certificate of Merit from its insurance company for having completed 218,000 man hours without a lost time accident. Since the period covered by this Award, The Crescent Company has operated for 40,000 additional man hours without a lost time accident—a total of 258,000 man hours. Mr. Milton C. Sapinsley is general manager of the company.

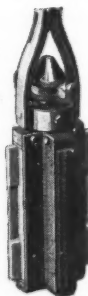
## Removes Rust

A new rust remover is being distributed by Premar Co., 3016 Somerton, Cleveland Heights, Ohio. Known as Rusty's Rust Remover, it is made especially for cleaning rust from chromium, aluminum, brass, bronze,



silver and any other metal. Just rub it on and wash it off. Packed in cartons containing 24 4-oz. bottles, priced at \$2.25 per dozen.

## Sunnen Cylinder Grinder



Introduced several years ago by the Sunnen Products Company, St. Louis, Mo., for cylinder grinding work on Austins, ice machinery, outboard motors, light plants, compressors and other motors with small-bore cylinders, the Sunnen Junior Cylinder Grinder is proving an exceptionally handy piece of shop equipment for use on the Ford V-8 "60" motor.

Employing the same operating principle as the famous Standard Sunnen Grinder, the Junior Model uses two stones and two non-cutting guides to produce a straight, round hole. Like the larger grinder, it can be operated at any angle and adjustment is fast, easy and positive. The Junior Grinder will remove from two to three thousandths per minute with a guaranteed accuracy of half a thousandth. Stones can be changed from roughing to finishing in thirty seconds.

## Link-Belt Book

The Link-Belt Co., 519 N. Holmes Ave., Indianapolis, Ind., has released an attractive, 24-page illustrated book No. 2201, giving specifications, interchangeable parts and numerical lists of replacement timing chains for all automotive and marine engines.



# Go Ahead-Beat the Train!

## I'LL BUY THE WRECK

and I'll pay you cash—  
they make excellent used parts

# BEN'S

## USED AUTO PARTS

1111 to 1117 MONROE      All Phones, ADams 8161

**Stoppers** Another used parts dealer advertised "Drive Like Hell—We Need The Parts." Neither advertiser, we're sure, meant to be taken literally—but used these humorous (?) "stoppers" to get advertising attention.





# U. S. ELECTRIC TOOLS

## *Predominate in the Best Equipped Shops*

When shops and mechanics select U. S. Electrically-Driven Tools—and thousands of them have been doing so for years—they buy tools that excel in performance, and they pay nothing extra for that privilege. The fine quality of "U. S." Tools is based on over 40 years of experience in building and improving them.



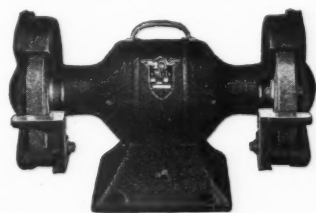
U. S. 1/4"  
AUTOMATIC DRILL

Sturdy, amply powered for general purpose drilling in intermittent service. Net weight 4 lbs. Universal Motor. Furnished for 32, 110, 220 and 250 volts. 15 ft. 3 wire rubber covered cable—1 wire for grounding drill. Indestructible rubber attachment plug. 3 jaw geared chuck.



U. S. 5/8"  
HEAVY DUTY  
DRILL

The most powerful 5/8" drill on the American market. Especially adapted for driving portable cylinder homes. Rugged construction. Gives long and efficient service. Universal motor. Ball bearing on armature and chuck spindle. Net weight 25 1/2 lbs. Furnished for 32, 110, 220 and 250 volts. A quality tool throughout.



U. S. "UTILITY" BENCH GRINDER

8" Grinder illustrated. Also 6", 7" and 10". Can be furnished with Safety Eye Shields. Designed for continuous service within rated capacities. Complete with 1 medium coarse and 1 medium fine first grade grinding wheel. Motors not universal, ball bearing totally enclosed dust proof. Toggle switch in base of all grinders.



U. S. VALVE SEAT GRINDING SET

The New Universal Set (No. 2000) will quickly and accurately recondition any type valve seat, accuracy within .001". Vibrating action built into set. Contains wide assortment of wheels and pilots for reconditioning most passenger cars, including Ford. Universal motor. Self-releasing trigger switch. 15 ft. 3 conductor rubber covered cable and attachment plug.

For information covering the entire line of United States Electrical Tools, write for the 40th Anniversary Number of our Catalog—72 pages of money-making opportunities for you.

**THE UNITED STATES ELECTRICAL TOOL CO.**  
Cincinnati, Ohio, U. S. A.



**TURI-VAC**  
AIR LINE  
VACUUM  
CLEANER

**Hard to Believe.. but True**

● Laboratory tests prove that the new TURI-VAC creates a greater vacuum, does a better cleaning job, than many motor-driven units selling for twice and three times as much. Yet it is very light and easy to handle. Brush attachment makes it possible to pick up lint, dog hair and other dirt embedded in upholstery...With the TURI-VAC available, there is no reason why your station shouldn't offer vacuum-cleaner service—a courtesy that MOST customers demand and ALL appreciate. A small investment that pays BIG dividends.

**THE LUBRICATION CORPORATION**  
910 S. Michigan Avenue,  
Chicago

Ask Your Wholesaler  
—or write for folder

See also pages  
101 and 104

**A Standix PRODUCT**

**The Ferodo line is complete...**

Sets — Roll Linings — Brake Blocks — Clutch Facings.

**FERODO**  
BRAKE LININGS

**KEASBEY & MATTISON COMPANY**  
AMBLER, PENN.

**CANCEL YOUR MEMBERSHIP in the ANCIENT ORDER of BRAKE LINING CUSSERS**

Make this interesting test... On a Ford brake job where you have condemned the lining... Install the correct (always inexpensive) Palmer Device... You will stop cussing the lining. Read... "There Is A Cure"... All about servicing brakes for Fords... Yours for the asking... Postage Prepaid... Just drop us a postcard—

**PALMER MFG. COMPANY**  
1479 S. Michigan Ave. Chicago, Ill.

## Overload Springs for Chevrolet Trucks

The St. Louis Spring Company, St. Louis, Missouri, manufacturers of Moog-St. Louis Replacement Springs, announce the C-90 and C-91 Overload Helper Springs especially engineered for the new 1937 Chevrolet  $\frac{3}{4}$  and 1-Ton trucks just introduced.

These overload springs provide overload protection for all loads from 1500 to 2000 pounds extra capacity. Made of electrically heat treated tested alloy steels, these new overload springs are provided with special fittings that require no holes or drilling of holes. They can be installed with a minimum of time and labor. Two-inch width, six or seven leaves.

## New CHEK-CHART

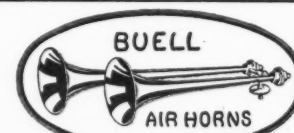
The Seventh Edition of CHEK-CHART has just come off the press. This new CHEK-CHART is considerably more than just another edition. Attractive covers in a striking design in brilliant red and blue, prominently display the new CHEK-CHART emblem. One of the outstanding features in the body of the book is the use of two-color printing of both text and illustrations in the instruction pages, tables, body chart, etc.

The seven instruction pages have been entirely rewritten along new lines of thought, to give the service station operator the best possible conception of automobile lubrication and a general outline of the operation and lubrication of various car parts including engine, fan, water pump, distributor, transmission, differential, universal joints, wheel bearings, shackles, springs and all parts which require lubrication or servicing.

Tire sizes and recommended pressures are given for all car models from 1932 to 1937. Anti-freeze proportion tables have been extended to cover temperatures as low as 60 deg. below zero. A Body Chart provides the necessary information for lubricating modern car bodies to eliminate squeaks and wear, and gives complete instructions for chassis tightening.

These preliminary pages are followed by 176 pages of chart diagrams covering a total of 402 models. Of these, 334 are passenger car models and 68 are truck models. All popular models are adequately provided for by diagrams, from 1933 to 1937, inclusive.

Published by The Chek-Chart Corporation, 624 South Michigan Avenue, Chicago.



## Carry Conviction Sound Range 1 to 10 Miles

Their Power Avoids Accidents  
Their Courteous Command Keeps Open the Right-of-Way  
Powered by 200 pounds of air pressure  
For Passenger Cars, Busses, Trucks, Trains

Write for Literature  
**BUELL MANUFACTURING COMPANY**  
2989 Cottage Grove Chicago, Illinois

## CUT LABOR COSTS

### with this SAFE PRESSURE BLEEDER TANK



Save the time of the second man. It takes only 1 to do a bleeding job with this tank. No pedal pumping or hand filling. Complete with connections — safety valve, hose, gauge, air valve.

Write.

**CURTISS & SMITH MFG. CORP.**  
Pottstown, Pennsylvania

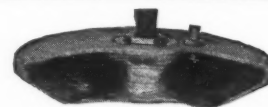
## HACKETT Universal Roller



### NOW IN BIG DEMAND

New Type Universal Blade, fits all arms. Blade rolls in action, no bending of rubbers. 7-ply wiping features give 100% wiping, therefore, clear vision at all times.

**HACKETT AUTOMOTIVE ACCESSORIES CORP.**  
Providence, R. I. U. S. A.  
Mfrs. of Wiper Arms, Dual Wiper Attachments, Inside Wipers, License Plate Frames, Cigar Lighters, Magnetic Trouble Lights, Shimmy Stops, Parking and Fender Guides, etc.



Cross Section

## Finishes are Safe with this PNEUMATIC POLISHING HEAD

You can use a polisher without injury to the finish when you use this pneumatic polishing head. In sets, with covers, and adapter for any motor; or separately.

Manufactured by  
**AIR PRODUCTS COMPANY**  
ROCKFORD, ILL.

Address All Correspondence to  
**A. F. STRAWSER CO., ROCKFORD, ILL.**

## THE LINE THAT LEADS TO PROFITS

## REMCO SHOP EQUIPMENT

Hydraulic Presses, Wrecking Cranes, Car Washers, Jacks, Trestles, Creepers, Oil Spray Guns, etc.

Write for FREE literature.  
**MANLEY PRODUCTS CORPORATION**  
State & Hay Sts., York, Penna.



## New Bantam Announced

In an exclusive interview with the Detroit editor of Chilton Publications, R. S. Evans, Pres. American Bantam Car Co., Butler, Pa., disclosed engineering details of the new Bantam car and described plans for its distribution. The financial set up has been completed and the company is proceeding to complete the final details of design and production. The company is pointed for a minimum volume of 10,000 units and is prepared to increase the schedule as required.

Application has been made for space at the New York Show. In addition, the line will be shown in Chicago and at the Newark Truck Show. The Bantam line will consist of one passenger car model—the coupe—and three truck models—quarter ton chassis, quarter ton pick-up express, quarter ton panel express. Some time later in the year they intend to announce a new roadster.

The company will merchandise the line in conventional fashion through dealers and a limited number of distributors. Dealers preferably will be those who can handle this line in addition to a non-competitive line rather than exclusive Bantam dealers. Delivered price will be in line with previous practice. Standard coupe will deliver at least 15 per cent lower than lowest priced car on market.

So far as design is concerned, the car is being completely modernized and redesigned throughout. Although but slight modifications will appear in the lines of the coupe body shell, the hood, grille, and fenders will represent the latest styling motif. The rear end will have the modern rakish effect by the use of an apron below the back panel, mounting the spare tire in a recess.

The engine has been materially changed for improved performance. Bore and stroke and outward appearance remain the same. However, they will use an aluminum alloy cylinder head with 7 to 1 compression ratio. Brake horsepower has been increased from 13 to 19. The lubrication system has been completely changed. The two crank main bearings formerly ball bearings have been changed to babbit bearings of the same diameter.

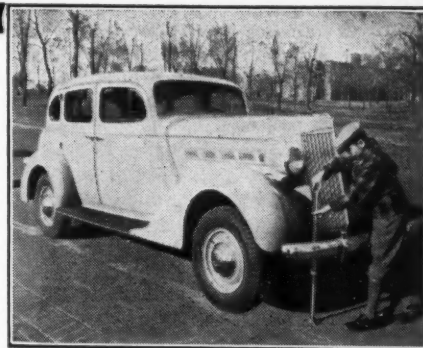
The frame is new with a V-bracing member to accommodate a change in springing. The transverse spring formerly used is retained at the front but semi-elliptic springs now are used at the rear, providing a Hotchkiss drive. Engine and transmission will be mounted on rubber. Special small diameter low pressure tires have been developed by Firestone for the new line. They take only 16 pounds of air pressure.

Wheelbase remains 75 in. with narrow tread as formerly.

### Morse Chain Equipped

A check-up of motor car registrations reveals the fact that out of 1,700,000 cars equipped with timing chains during the last twelve months, 1,200,000 or 70 per cent were equipped with Morse Timing Chains, a bulletin from Morse Chain Co., Detroit, Mich., stated.

## How a Jack Can Help Make Winter Driving SAFER



The Ace-Hy Hydraulic Bumper Jack makes putting on and taking off chains a simple, easy matter.

No need to risk disaster on hazardous winter roads because of the mess, trouble and inconvenience of the old-fashioned jack.

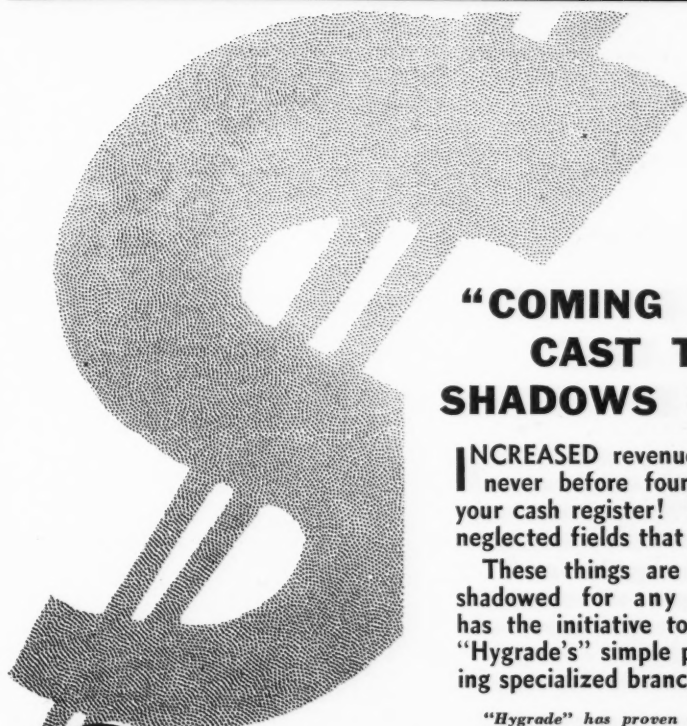
Ace-Hy is the modern jack for the modern car. No kneeling . . . no crawling under car . . . no projecting levers . . . nothing to put together.

You can build winter sales by making winter driving safer. Show how easy it operates, see how easy it sells. Place your order for stock now.

There's a heavy duty model for garages and repair shops.



**VULCAN MANUFACTURING CO.**  
Saint Paul - - - Minnesota



## "COMING EVENTS CAST THEIR SHADOWS BEFORE"

**I**NCREASED revenue! Dollars that never before found their way to your cash register! Rapid upbuild in neglected fields that pay handsomely.

These things are definitely foreshadowed for any business that has the initiative to capitalize on "Hygrade's" simple plan for developing specialized branches of repair.

"Hygrade" has proven a mint for others. What it has done for them it will do for you. Write for convincing facts.

HYGRADE PRODUCTS CO.  
516 West 34th St., New York City

*Facsimile  
Service Parts  
for*  
**CARBURETORS  
FUEL PUMPS  
SPEEDOMETERS  
SHOCK  
ABSORBERS  
TEMPERATURE  
GAUGES  
FUELLINES  
AND FITTINGS**

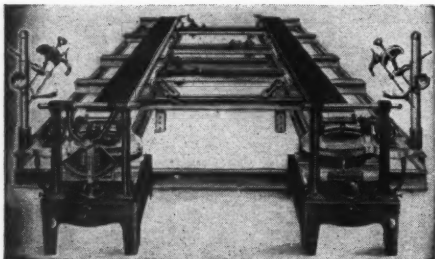
# "HYGRADE"

"Specialization  
Pays!"





## ACCO AUT-O-METER



**A DE LUXE PRODUCT  
COMPLETE SERVICE  
IN ONE UNIT**

**EASY TO OPERATE WITH  
RESULTS GUARANTEED**

**PAYS FOR ITSELF ON  
NEW OPERATING PLAN**

**USE COUPON BELOW**

## AUTOMOTIVE PRODUCTS CORPORATION

Manufacturers of Automotive  
Service Equipment

59 E. Van Buren St.  
Chicago, Ill.

Automotive Products Corporation,  
59 E. Van Buren St., Chicago, Ill.  
Gentlemen:

I am interested in more information on the following  
products and how I can purchase Acco equipment out  
of income.

- ☐ Acco Electro-Lift.
- ☐ Acco Frame and Axle Straightener.
- ☐ Acco-Meter Wheel and Steering Analyzer.
- ☐ Acco Wheel Balancer.
- ☐ Acco Brake Testers.
- ☐ Acco Auto-O-Meter-Combination Acco Frame and  
Axle Straightener, and Acco-Meter Wheel and Steering  
Analyzer.
- ☐ Acco Du-O-Meter-Combination Brake Tester and  
Acco-Meter Wheel and Steering Analyzer.
- ☐ Acco Tri-O-Meter-Combination Auto-O-Meter and  
Acco-Brake Tester.

Name .....

Address .....

City .....

### Joe Thorne Preparing for '38 Vanderbilt Race

Joe Thorne, America's millionaire speedway driver-car owner, made a bid for a starting place in the recent German Grand Prix, in which Ernest Von Delius was killed, but he failed to find a suitable mount. With National Championship racing in the states not as active this year as in past seasons, Thorne hopped an ocean liner for a look at the racing situation in Europe.

He also investigated European racing engineering with a view to getting a team together that might carry the Stars and Stripes victorious over the Europeans when they came back to the States next year for the third running of the George Vanderbilt Cup at Roosevelt Raceway. In the inaugural Vanderbilt event in 1936, Tazio Nuvolari, of Italy, outran the American entrants, and the second classic last July found Bernd Rosemeyer, of Germany, the winner.

### Federal Gasoline Tax Receipts Show 13% Gain

Federal gasoline tax collections stood at \$90,450,940 for the first six months of 1937, a gain of 13 per cent over the \$79,818,213 collected during the first half of 1936, according to reports received from the Bureau of Internal Revenue by the American Petroleum Industries Committee.

Federal tax receipts on lubricating oil, levied at the rate of 4c. per gallon, were \$15,848,996 for the first six months of 1937, a gain of 19 per cent over the \$13,371,540 collected during the first half of last year. Approximately half of the lubricating oil is used by motor vehicles and the balance by industry.

### New Ha Dees Heaters

Liberty Foundries Co., Twenty-third Avenue and Tenth Street, Rockford, Ill., has announced a new line of hot water heaters. Known as the H-400 Series, the new line includes a built-in defroster, and consists of



seven models ranging in price from \$9.95 to \$22.95. There is also a new dual water flow "Ford Special" model, and a rear seat heater known as the "Super Sedan" model.



**Flint** The Loss-Proof  
Compression  
SPARK PLUG!

Highly endorsed by fleet owners because of their uniformly excellent performance, longer service and lower cost per mile. Made in the correct types for every motor.

Order from your jobber!  
Write for literature!

C. V. S. Manufacturing Co.  
Flint, Michigan

### Get the Facts about this

**COMPLETE  
VULCANIZING  
PLANT in 1 MOLD**

An efficient mold that produces perfect vulcanizing. Handles wide range of tire sizes. Perfect insulation—low operating cost. For gas, electric or steam line. Fully guaranteed.

**CHASE MFG. CO.**  
3208 Delmar Bl.,  
St. Louis, Mo.  
Write for Prices

**Radiator, Battery Repairing  
and all sorts of soldering  
jobs easily done with**

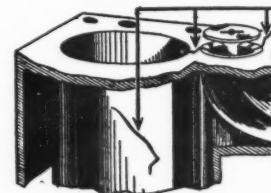
**TORIT**  
**ACETYLENE  
TORCH No. 23**

Simply connect to Presto tank. Price, including a set of 4 tips, \$6.75. Order from your jobber.

**TORIT MFG. CO.**  
290 WALNUT ST., ST. PAUL, MINN.



### Takes 30 Minutes—Lasts Forever WONDER WELD



Repair valve port and inside cylinder cracks with Wonder Weld in 30 minutes. Insures permanent seal. Write for details.

**MILLER MFG. CO.**  
1220 KAIGHN AVE., CAMDEN, N. J.

### A D L E R IGNITION INSTRUMENTS ACCURATE—LOW COST



\$3.95  
Complete with instructions

#### ● SYNCHROMETER

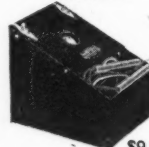
Ignition timing instrument of PROVEN MERIT. Shock-proof, compact, highest quality.

#### ● CIRCUIT ANALYZER

— A Real Trouble - Finder — Tests condensers on or off car. Checks all electrical circuits and units on car.

SEE YOUR JOBBER  
OR WRITE

**ADLER MFG. CO.**  
North Chicago, Ill.



\$9.00  
Complete with instructions



# POTTER

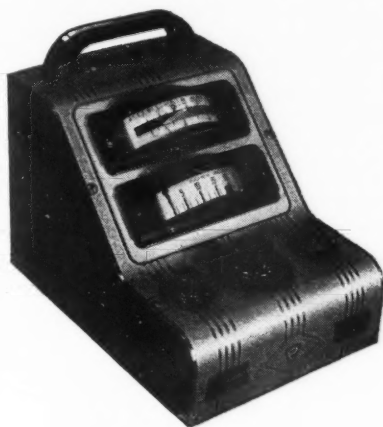
## COMPLETE LINE ENGINE TESTING EQUIPMENT



### NOW READY—

An entirely new line of engine testing equipment engineered, developed and built by men with years of experience in this field.

SOLD ON CONVENIENT  
CREDIT TERMS



### THE POTTER GAS ANALYZER

Illustrated above is the Exhaust Gas Analyzer—one of the five new test instruments developed by Potter Engineers. This impressive and vitally necessary instrument quickly and accurately indicates carburetion efficiency. No external electrical connections are necessary. The instrument is light and portable and can be used on the service floor or placed inside the car for road tests under actual running conditions. It is a builder of service sales because it reveals true conditions. It leaves nothing to guesswork.

Ask Your Jobber or Write to

**THE POTTER COMPANY**

1950 Sheridan Road

NORTH CHICAGO, ILL.

U. S. A.

## Eyston to Attempt World's Record

The supremacy which the now retired Sir Malcolm Campbell has held over the speed realm for the past six years is to be challenged within the next few weeks.

As MOTOR AGE goes to press, Capt. George E. T. Eyston, fellow countryman of the British Campbell, is on the high seas bound for the United States with a new giant racer designed for speeds of 350 miles per hour.

He plans to go to the famous Bonneville Salt Bed, near the Utah-Nevada line, where in each of the last two years he established a string of distance records current in the international speed list.

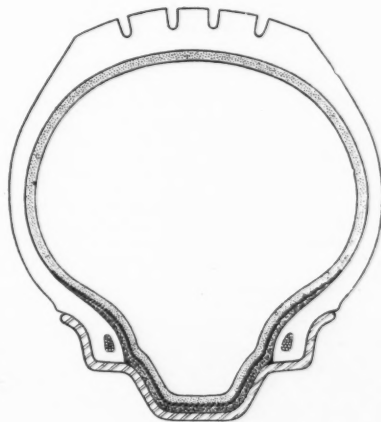
It was on this same natural speed course, which first received serious recognition for record activity in 1934, that Campbell set the existing world land speed mark of 301.1292 miles per hour in September of 1935.

While the United States looks forward to a glimpse of Eyston's new car, English racing experts have informed MOTOR AGE of these facts regarding the car:

1. It is powered by a 3000-hp. Rolls Royce engine of the Schneider Cup type.
2. It incorporates features recommended by Sir Malcolm Campbell and learned by him in attempts on the salt bed.
3. Wind tunnel tests and specifications guarantee speeds of at least 350 miles per hour.

## U. S. Rubber Develops New Safety Tube

United States Rubber Co. has announced a new Royal Master safety tube with a laminated 3-ply base which is said to overcome tube failures due to pinching, abrasion, rust and corrosion. The new laminated construction gives extra protection on the rim



side, extending over that part of the tube which comes into contact with the steel rim, and on up the walls beyond the toes of the beads. Additional safety is provided through use of heavy gage heat-resisting stock which withstands extreme tire heat and high brake drum temperatures.



## Take the MUSCLE out of METAL CUTTING

Starrett Flexible Back Hacksaw Blades are made especially for the kind of twisting, chattering, blade-breaking cuts you run into in automotive repair work. They're perfect for tubing, sheet metal, B-X and similar work that strips the teeth from ordinary blades. Your Auto Supply Dealer stocks them.

Starrett Automotive Tools Booklet "G" shows many useful tools and tells how to do precision repair and overhaul jobs. Free on request.

### THE L. S. STARRETT CO.

World's Greatest Toolmakers  
Manufacturers of Hacksaws Unexcelled  
Steel Tapes—Standard for Accuracy  
Dial Indicators for Every Requirement

ATHOL, MASS., U. S. A.



# Use Starrett Tools

## LOWER COSTS

on all types of work explains the nation-wide popularity of Gardiner Solders. Used and recommended by leading car makers and body builders, their uniform high quality permits faster and neater work . . . saves both time and material because they work faster and go farther. Yet they actually cost less than "nameless" solders, because produced in volume by the most modern methods.

The Gardiner Line meets every soldering need . . . includes Acid and Rosin Core Solders in various alloys and core sizes . . . body, bar and wire solders . . . Permanent Lining Babbitt metal. And Gardiner's complete facilities assure prime quality and prompt service on special solders to meet any specification requirements.



PACKED IN  
1, 5, AND  
20-LB. SPOOLS



4839 S. Campbell Ave., Chicago, Ill.

### One Puller Handles All Ford V-8 And Lincoln Zephyr Generator Pulleys.



All 17 types of generator pulleys are easily and quickly removed with this tool. Positively eliminates danger of springing shaft, breaking pulley wheel or battering threads on shaft. Order today—No. 535. Price \$1.65.

National Machine & Tool Co.  
Jackson, Mich.

### New Atlas Lathe Manual

An entirely new lathe book, the Atlas "Manual of Lathe Operation," released recently by Atlas Press Company, promises to become a permanent reference source for all shop men, both experienced and beginners. Its 272 pages illustrate and describe in easy-to-understand language the latest technical data for machining the new metals and plastics.

The new metal binding and divisional index tabs are a marked improvement. Chapter Headings: Lathe Care and Construction, Theory of Metal Cutting, Cutting Tools, The Machining of Various Materials, Holding the Work, Drilling and Boring, Thread Cutting, Lathe Attachments and Their Uses, Woodturning on the Metal Lathe, Machinists' Tables, Index, and Pages for Shop Notes.

The Atlas Manual is priced at \$1.00, delivered to any point in United States. For further information, write Atlas Press Company, 1819 North Pitcher Street, Kalamazoo, Michigan.

### Handbook for Heavy Cleaning

The Magnus Chemical Co., 112 South Avenue, Garwood, N. J., has recently published a new Automotive Cleaning Handbook describing equipment and methods for cleaning bus and truck bodies, radiators, garage floors and parts degreasing. A practical guide for the garage operator.

### New P & D Catalog

P & D Mfg. Co., Inc., Long Island City, N. Y., has recently published their new catalog No. 30, which is now ready for distribution. This 96-page book lists all the products manufactured by the company, and includes complete ignition specifications for all cars and trucks. Write for your copy.

### Anti-freeze Posters

The first of a series of posters has been issued by Publicker, Inc., 260 S. Broad St., Philadelphia, Pa., beginning their drive for next winter's anti-freeze business. The first poster is entitled, "Don't Spoil Your Vacation," and illustrates a series of motoring mishaps that may befall the vacationist who fails to have his car properly checked. The only mention of Thermo is the statement that a 10 per cent solution of Thermo Royal makes an excellent rust-preventive after the cooling system has been cleaned.

### Grease Retainer Manual

A new 44 page manual on the subject of replacing grease retainers on all makes of cars has been published by the National Motor Bearing Co., 1220 78th Ave., Oakland, Cal. It lists the retainer stock number, position on the car and price, and has been brought up to date with new car designs. Copies will be sent without charge upon request.

### Edison-Splitdorf Window Displays

The Edison - Splitdorf Corp., West Orange, N. J., makers of Edison Spark Plugs, has recently set up several suggested window arrangements built around the company's 1937 display material. One of these attractive arrangements is pictured above showing three attractive window cards, a banner, metal tacker sign, window decalcomania and product display.

## ARE YOU IN ON THIS?



Why stock 1937 Chevrolet generators when an Able Adapter will make it possible to use previous models on the 1937 car? It can be applied in one minute. Guaranteed. Carry a few in stock. Be ready for an emergency—make Big Profits.

### TRADE DISCOUNTS:

3 to 6, 25%  
6 to 12, 33 1/3%  
Dozen lots, 50%  
(One cent each additional west of the Mississippi)

### ORDER BY MAIL

LIST PRICE **50¢** each, post paid

**ABLE PRODUCTS COMPANY**  
356 North Gay Street Baltimore, Maryland

## "PERFECT SEAL"

AS SPECIFIED BY  
16 OF THE LEADING  
CAR MANUFACTURERS  
PROTECTS YOUR  
HEAD GASKETS  
AGAINST SEEPAGE  
OF COOLING LIQUIDS



Ask Jobber or Write Factory  
P.O.B. MFG. CO., Cincinnati, O.

FOR QUALITY and  
DEPENDABLE SERVICE  
DEMAND FROM YOUR JOBBER



**GUARANTEED  
AUTOMOTIVE PRODUCTS**

LION AUTO PARTS & MFG. CO., INC.  
CHICAGO, ILL. DALLAS, TEXAS



## TRADE MARK NOC-OUT HOSE CLAMPS

THE HOSE CLAMP WITH  
THE THUMB SCREW

Standard equipment of the automotive industry. Adjustable - one size equals many. Quick tightening, perfect seal. At all Jobbers.

Pat. No. 1,382,813.

**WITTEK MFG. CO.**  
4305 W. 24th Pl., Chicago, U.S.A.

## THE 60 MINUTE WAY

IT'S ZECOL today. ZECOL is going over big because of its Quality, Attractive Packaging and Price, and because it does a perfect lasting job, so much Quicker and Easier. ZECOL is now available also in the new export style cans. Ask for details.

Sole Manufacturers

**ZECOL, Inc., Milwaukee, Wis.**

*to Automobile Beauty*

**ZECOL  
WAX**

© 1937

Be sure it's a  
Genuine  
**PUROLATOR**





## Quality Comes First

In This  
Guaranteed  
Kregger Product

-and Then Your **PROFIT**



Drop Forged Shock Absorber Links for All Fords. Exactly Duplicate the Original Part.

CUSTOM BUILT  
**The KREGER LINE**  
For FORD OWNER BUSINESS

For running-in new and rebuilt engines use auxiliary lubricants containing "dag"\* Brand colloidal graphite.

Acheson Colloids Corporation

Port Huron  Michigan

\*REG. U. S. PAT. OFF.

**THE TWIN POWER RINGS OF THE**  
**International LINE**



You can safely put your faith in Chief Power Rings, and when you recondition the cylinders, use Super-Scraper sets. The oil mileage will be amazing.

**THE INTERNATIONAL PISTON RING CO.**  
CLEVELAND, OHIO.

**AUSCOLIFT**  
THE INDUSTRY'S NUMBER ONE  
**BUMPER JACK**  
NO GEARS . . . NO RATCHETS  
NO GREASE OR DIRT  
It Is Non-Hydraulic, Yet Works  
FASTER - SIMPLER - EASIER  
EASTERN LIST PRICE \$4.00—WEST COAST  
10% ADDITIONAL



Manufactured Exclusively by  
**AUTO SPECIALTIES MFG. COMPANY**  
ST. JOSEPH, MICH. . . WINDSOR, ONT., CAN.

### Grey-Rock Movie

Brake men will learn about brakes the "painless way" in 1937 through a new film, "We Learned About Brakes from Them," which has recently been released by the United States Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa. The story is a humorous account of a brake man's travels around the country to learn the latest methods of servicing brakes in order to keep from going to jail. See this picture when your Grey-Rock dealer has his showing.

### Goodrich Farm Bulletin

A new pamphlet by the B. F. Goodrich Company is available to every farmer using rubberized equipment. It deals with water inflation for farm service tires, and may be obtained by writing the company at Akron, Ohio. The pamphlet covers information on the volume of water together with its weight, to be used in various sized tires. Two pages are devoted to load and inflation tables on farm service tires for both tractors and implements.

### Thermoid Brake Lining Cabinets

Two new brake lining cabinets have been developed by the Thermoid Rubber Co., P. O. Box 1041, Trenton, N. J., to anticipate the requirements of every type of retail automotive outlet. The smaller of the two provides three roomy shelves designed to hold 25 sets. The larger cabinet holds 75 sets and 10 rolls on its five shelves. Both cabinets are made of heavy gage metal, painted black and trimmed with chromium. Attractive deals have been developed to make each of these units easily available.

### Book on Ford Products

"The Ford V8 Cars and Trucks" is the title of a new book by Victor W. Page, published by The Norman W. Henley Publishing Co., 2 West 45th St., New York City. It contains a detailed description of the construction, operation and repair of all the V-8 models including the 1937 model, with illustrations of the different assemblies and of repair operations. Containing 705 pages, the book is a complete and practical manual for servicing the Ford V-8. Price \$2.50.

### 1937 New Departure Catalog

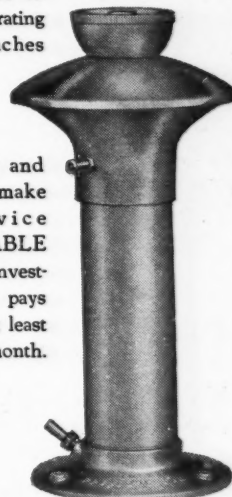
Just off the press is the 1937 standard catalog of New Departure Ball Bearings. In addition to the up-to-date listing of all available types, sizes and list prices are interesting sections on bearing selection, mounting directions, fits and tolerances, equivalent bearing tables and telegraphic code. Write New Departure Division General Motors Corp., Bristol, Conn., for your copy, specifying Booklet "S".

### Tune-Up Wall Chart

The Carter Carburetor Corp., 2836 N. Spring Ave., St. Louis, Mo., offers a Motor Tune-Up Wall Chart which gives complete tune-up specifications for all Carter-equipped cars and trucks. The chart, measuring approximately 25 x 36 in. gives complete information for a thorough tune-up, including such data as correct spark plug and breaker point gaps, timing information, valve clearances, idle and high speed carburetor adjustment settings and correct float levels. The wall chart is offered free of charge.

## MULTIPLY LUBRICATION PROFITS WITH KENT PRESSURE-PAK

● Front wheel bearing lubrication is a rich, untouched field of extra profits and the KENT PRESSURE-PAK makes your station headquarters for this vital service. A fully proved device that forces out all dirt and grease and pressure-packs the bearing with fresh lubricant. Any service man can operate it. Its demonstrating value clinches the sale.



Its speed and economy make the service PROFITABLE . . . An investment that pays for itself at least once a month.

THE LUBRICATION CORPORATION  
910 S. Michigan Avenue  
Chicago

A **Standix** PRODUCT

Ask Your Wholesaler—or write for folder

See also pages 96 and 104



1837 1937  
**YOU MAKE MONEY SELLING PRAIRIE-SCHOONER TRAILERS**

**\$295** Clean sales. No trade-ins. Liberal discounts. Right price range. Write for details.  
Equipment Extra Fully Equipped

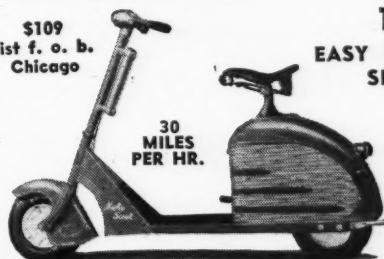
**Prairie - Schooner Trailer Co.**  
Elkhart, Indiana

## PROFIT WITH THE NEW MOTO-SCOOT

120 MILES PER GALLON!

EASY RENTALS. EVERYONE IS MOTO-SHOOTING. SERVICE STATIONS! REPAIR STATIONS!

\$109 list f. o. b. Chicago



30 MILES PER HR.

Why not cash in on this most unusual opportunity offered to you at this time. Operators everywhere are making money renting and selling this newest sensation. Many valuable dealer territories still available. Write or wire now for FREE booklet to Dept. MA 9,

**MOTO-SHOOT MFG. CO.**

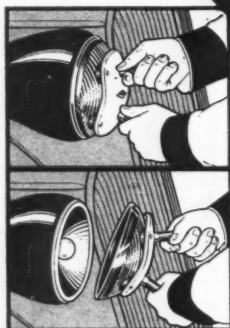
219 So. Western Ave. Chicago, Ill.

**THOUSANDS SOLD!**  
Quantity  
PRODUCTION BRINGS  
**NEW, LOW  
PRICES**



## HEADLIGHT

**Lens Tool**  
formerly **\$2.00**  
**NOW \$1.00**  
**RETAIL**



**AVOIDS  
BREAKING  
Glass Lens!  
Protects Hands  
SAFE!  
QUICK!  
EASY!**

THE big demand for this quality-built, handy headlight lens tool makes possible new low price of only \$1.00 retail. Hundreds of your customers have had trouble with lens breakage when servicing doorless type headlights.

This strong, handy tool with metal hand guard and suction cup lens grippers quickly removes sticking lens—protects hands and makes headlight service **SAFE—QUICK and PROFITABLE.** For Plymouth—Dodge—Chrysler—Nash—DeSoto—Hudson—Terraplane—Auburn—Studebaker—Graham—Lafayette.

Gas stations, garages, car dealers, fleet owners need this tool. Avoids offending good customers by turn-downs. Build bulb sales and good-will. Approved by motor car manufacturers. Any quantity sold at new price. Your jobber has it—or write direct.



**MILLER TOOL & MFG. CO.,  
INC.**

DETROIT — MICHIGAN

Manufacturers of Approved Service Tools  
Since 1914

## General Motors

### Overseas Sales

Sales of General Motors cars and trucks to dealers in the overseas markets during July totaled 31,341 units, representing an increase of 23% over the volume in July of last year.

In the first seven months of 1937, sales of 219,162 units represented an all-time high volume for that period, and an increase of 10.2% over the volume in the first seven months of 1936. For the twelve months through July, 1937, sales totaled 344,959 units—an increase of 10.7% over the volume in the twelve months ended July 31, 1936.

These figures include the products of the Corporation's American, Canadian, English, and German factories sold outside of the United States and Canada.

### Triplewear Brake Check

One of the most aggressive sales promotion and advertising campaigns ever attempted by the Triplewear Brake Linings Corporation around the theme of "Greater National Safety Through Better Brakes" is well under way, according to a statement recently issued by J. O. Camp, General Sales Manager, for the company.

The manufacturer is enlisting the most diversified use of media in connection with its campaign and only recently announced the development of Triplewear's "Official Pocket Brake Check," a "Brake Tester" gauge which it is claimed enables the motorists to check their own brakes against legalized "Stopping Distance Laws." This Brake Check gauge is the chief subject of all its present advertising copy.

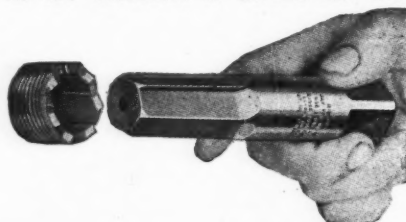
The campaign was designed primarily to stimulate greater national demand for Triplewear Products and to increase the volume of sales of the Company's present Jobbers and Dealers.

Triplewear is offering the Brake Check gauge directly to the motorists through newspaper advertisements, news readers and bulletins issued by Safety Organizations, Automobile Clubs and other organized groups interested in National Safety.

### Broken Stud Extractor

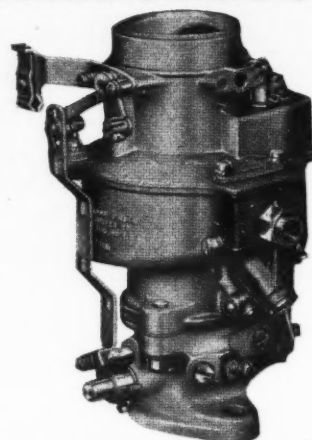
#### Has New Features

The Ridge Tool Co., Elyria, Ohio, makers of Ridgid pipe tools, has announced a new broken screw and stud extractor. The straight flute design permits drilling large holes through broken threaded ends and the flutes engage by forming shallow grooves as the extractor is driven in. This



design permits extracting screws or studs broken off at depths without dismantling parts.

## LINKERT The World's Outstanding CARBURETOR



An Outstanding New Design for

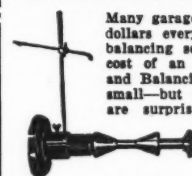
**CHEVROLET  
AND  
PLYMOUTH**

LANGSENKAMP-LINKERT CARBURETOR CO.  
INDIANAPOLIS - INDIANA

*There's Money in  
Wheel Balancing  
Service!*



Pat. No. 2036757

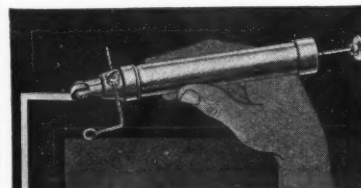


Many garages are making hundreds of dollars every year by rendering wheel balancing service. Why not you? The cost of an L & H Balancing Stand and Balancing Weights is surprisingly small—but the profits they will earn are surprisingly large. Investigate!

**WRITE  
for  
CIRCULAR!**

**HARLEY C. LONEY CO.**  
16517 Wisconsin, Detroit, Mich.

## MASTER PAINT STRIPERS



• Seven  
stripe  
widths—  
1/32"  
to  
2/16"  
•

### EASY TO USE

Lays a perfect paint stripe on Autos — Trucks, etc. Stripes lend that "professional touch" to every paint job.

**"Eye Appeal Means Buy Appeal."**

Sets \$1.50, \$2.50 and \$8.50.

Price. Ask your jobber or write us for literature.

**WENDELL MFG. CO.**

2533 N. ASHLAND AVE. CHICAGO, ILL.

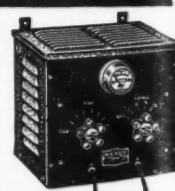
**Handy  
BATTERY CHARGERS**

LOWER OPERATING COST  
MEANS MORE PROFIT FOR  
YOU. No. 12-B Wall type.  
12 Battery size. **\$29.50**  
Price, without bulb

WRITE for Bulletins on complete line of "HANDY" chargers, testers and racks.

**BALDOR ELECTRIC CO.**  
(Electrical Mfrs. for 17 years)  
4375 Duman Ave., St. Louis, Mo.

**GUARANTEED for 2 YEARS**





## The Trade and Car Owners Are Going Big for



### **Sinko** SPIN-UR-WHEEL BEZ-L-BALL

Here is one of the most profitable of all the highly profitable lines SINKO has introduced in the past 10 years. A "natural" for sales. A great driving convenience.

Fits any wheel. In five colors, with or without jewel, chrome or enamel base. Also Bez-L-Ball in same colors for gear shift levers.

Write for details.

**SINKO TOOL  
& MFG. CO.**

351-371 N. Crawford  
Avenue  
Chicago, Ill.



### **THOR** MODEL 7 A SPRAY GUN THAT REALLY PAINTS

Makes Used Cars  
Like New. See Your  
Dealer TODAY!

### **BINKS HANDY No. 5**



### Touch-UP ● OUTFIT ●

Just the thing for  
touching up repaired  
spots on car bodies and  
fenders.

Cups Have  
SEAL TIGHT COVERS

Write for catalog with valuable  
information

**BINKS MANUFACTURING CO.**

Carroll at Kedzie Ave.

CHICAGO

Write Dept. AT-S

ILLINOIS

Unconditionally  
Guaranteed

## **UNIVERSAL** ADJUSTABLE-FIT **MUFFLERS**

MUFFLERS  
TAIL PIPES  
AXLES · GEARS  
CYLINDER HEADS  
CLUTCH PLATES



LEAK-PROOF  
BLOWOUT-PROOF

**UNIVERSAL PARTS, INC. CHICAGO**

### AMCO Extension Program

Sidney J. Black, who has lately been put in charge of West Coast business, is in the western territory now laying the groundwork for an aggressive extension program for the Asbestos Mfg. Co. He expresses great satisfaction with the initial reception accorded the AMCO line, particularly as to several new items recently cataloged. Increased advertising and sales promotional efforts have been approved by the company for 1937-8, in which, it is stated, the West Coast will share.

Mr. Black will continue to supervise the concern's field activities in the Middle West where he has long been established, with headquarters in the Mercantile Exchange Building, Chicago.

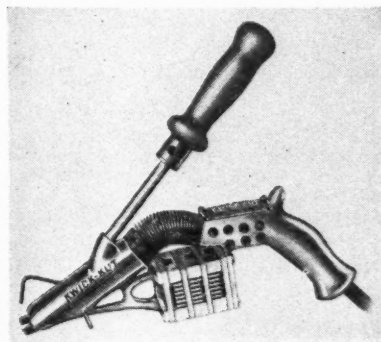
### Credit Conditions Improved

Customers of automobile tire and accessory stores made a larger proportion of their purchases on a credit basis but paid for them more promptly during 1936 than during 1935, according to a report issued June 14 by the Bureau of Foreign and Domestic Commerce, Department of Commerce. The statistics also show that the ratios of bad-debt losses to open-credit sales were found to be lower in 1936 than in 1935, in this survey of credit conditions which covered 14 kinds of retail trade located in 88 cities throughout the country.

### Kwick-Kut Announces

#### New Regrooving Tool

A new line of regrooving tools ranging in price from \$14.00 to \$40.00 and consisting of seven models, has been



announced by Kwick-Kut Mfg. Co., 3828 Arsenal St., St. Louis, Mo. The new line incorporates a new heating element built in the cutting head, new blade size, and air cooled handles.

# TOO GOOD TO CHANGE!

No important change in basic design has been made in Thexton Expanders since they were introduced to the trade.

● That is one of the best evidences of their merit.  
● Years of nation-wide use, in all kinds of cars and under all conditions, have proved that Thexton Expanders are sound in principle, correct in design, and thoroughly efficient. ● You're on safe ground when you recommend Thexton Expanders for positive, permanent and economical cure of piston slap!

## *Thexton* **PISTON SKIRT EXPANDERS**



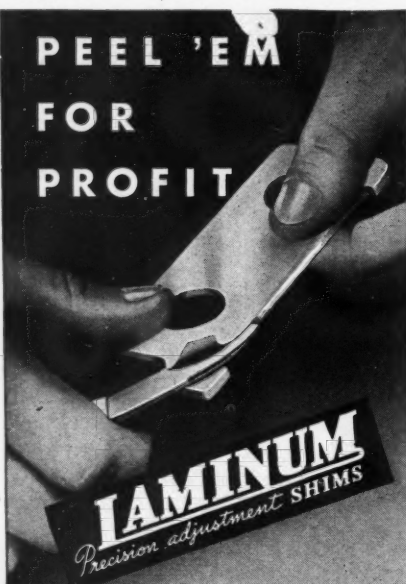
**THEXTON MANUFACTURING CO., Inc.**

Established 1907

MINNEAPOLIS, MINN.

Canadian Branch, Chatham, Ont.

**PEEL 'EM  
FOR  
PROFIT**



**BEARING ADJUSTMENTS  
THAT PAY...**

Precision adjustments—quick! Right at the job. No miking, no filing!... Just peel precision laminations from the brass LAMINUM shim. Standard for all makes of engines. **PEEL 'EM FOR PROFIT!**

LAMINATED SHIM CO., INC.  
MFRS., LONG ISLAND CITY, N. Y.

Replacement Sales by

**FEDERAL-MOGUL CORP.**  
DETROIT 788



**WRITE  
For Details On  
How To Make  
MORE MONEY**

An easier job, a quicker job, a better job. Costs less to do. Makes bigger profits for you—when you balance wheels with

**VAN'S  
Ideal Wheel Balancer  
Price \$18.00  
VAN'S  
AUTO SPECIALTY CO.  
CLYDE, OHIO**

**Glorifying the Spark Plug**

The magic of the movies, where perfect performance means so much, is dramatizing the perfect performance of the new spark plug now manufactured by the Electric Auto-Lite Company at Toledo, Ohio.

This behind the scenes shot in Hollywood shows the famous photographer, Hurrell, preparing to shoot pictures of beautiful Madeleine Carroll on "The Prisoner of Zenda" set, from which life-sized cut-outs were made for continuing Auto-Lite's sensational "Parade of the Stars" campaign.

As part of a gigantic tie-up between Auto-Lite spark plugs and Selznick International Pictures, full color cut-outs of the eye-soothing Madeleine Carroll are being placed in



theaters where "The Prisoner of Zenda" is being shown. Replicas of Auto-Lite spark plugs appear in close proximity, while the phrase "Both give perfect performance" further identifies them with the dramatic campaign carrying the story of these new plugs.

**Ferodo Builds \$400,000 Addition**

Plans for major plant expansion, due to increased demand from the automotive industry, have been announced by A. C. Teetsel, Managing Director of Ferodo and Asbestos Incorporated, makers of brake linings, clutch facings and industrial frictional materials.

Addition to the present New Brunswick, N. J., plant of a new building with 46,000 sq. ft. of manufacturing space and expansion of laboratory research facilities are included in the \$400,000 program. The new buildings will be designed and equipped for the production of woven and molded frictional materials, and will approximately double present plant capacity.



**Planning To "Carry On" This Winter?**

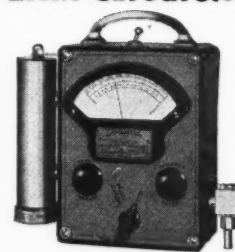
● If so, you need a dispenser that works in cold weather—a fast, clean, year-round dispenser that handles *all* grades of gear lubricant. We believe the **STANDIX LUBE DISPENSER** to be the only one that fills the bill in all respects. But don't take our word for it. Try it and judge for yourself.

THE LUBRICATION CORPORATION  
910 S. Michigan Avenue  
Chicago



Ask Your Wholesaler  
—or write for folder  
See also pages  
96 and 101

**Licks Carburetor Problems**



Serving thousands of mechanics throughout the nation, this Stromberg Exhaust Analyzer removes the costly trial and error method of carburetor adjustment. Tests made in two minutes—right before your customers' eyes—prove what's wrong.

It's a real money maker—sells job after job—because the customer **MUST BELIEVE** the evidence. Write for full information.  
**STROMBERG MOTOSCOPE CORP.,**  
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**D & T WHEEL BALANCING WEIGHTS**



Patent Nos.  
2029561  
2036757

Now made in seven sizes for Passenger cars and two sizes for Trucks for perfect dynamic or static wheel balancing. Neat, inconspicuous, installed instantly without tools. New clip cannot

damage tire. Weights will not lose off. Used and recommended by many leading manufacturers and jobbers. Write for our new catalog and prices.

**TURNER MANUFACTURING CO.**  
KOKOMO, INDIANA

**SEALED POWER  
PISTON RINGS**

Best in  
Old Cars!



Best in  
New Cars!